THE JOURNAL OF

NUTRITION

OFFICIAL ORGAN OF THE AMERICAN INSTITUTE OF NUTRITION

FREDRIC W. HILL, *Editor*

Department of Nutrition
University of California
Davis, California 95616

F. H. KRATZER
Associate Editor

E. NEIGE TODHUNTER
R. M. FORBES
Biographical Editors

EDITORIAL BOARD

STANLEY N. GERSHOFF
CHARLES H. HILL
DAVID KRITCHEVSKY
DONALD B. MCCORMICK
J. N. WILLIAMS, JR.
B. R. BAUMGARDT
H. FISHER
CHARLES S. LIEBER
GILBERT A. LEVEILLE
O. NEAL MILLER
WALTHER H. OTT
C. FRANK CONSOLAZIO
H. D. EATON
RAYMOND REISER
HAROLD H. SANDSTEAD
MYRON WINICK
H. H. DRAPER
JOHN E. HALVER
HELLEN M. LINKSWILER
OSCAR W. PORTMAN
HERSCHEL SIDRANSKY
JAMES M. IACONO
R. W. LUECKE
FRED H. MATTSON
ROBERT A. NEAL
MALDEN C. NESHEIM

VOLUME 104

JANUARY–DECEMBER 1974

PUBLISHED MONTHLY BY
THE AMERICAN INSTITUTE OF NUTRITION
BETHESDA, MARYLAND

THE JOURNAL OF NUTRITION®
® Trademark registered, U.S. Patent Office

Copyright © 1974 by
THE AMERICAN INSTITUTE OF NUTRITION
All rights reserved

Contents

No. 1 JANUARY 1974

Editorial Announcements .....

Leonard Amby Maynard—A Biographical Sketch. *H. H. Williams* 1

Induction in Rats of Glucose-6-phosphate Dehydrogenase by a 90% Carbohydrate Diet and 8-Azaguanine Insensitive Induction of Glucose-6-phosphate Dehydrogenase following a Transfer from the 90% Carbohydrate Diet to a 90% Protein Diet. *D. O. Mack, Julia J. Watson, A. M. Chandler and B. Connor Johnson* 12

Calcium and Phosphorus Homeostasis in Horses. *R. A. Argenzio, J. E. Lowe, H. F. Hintz and H. F. Schryver* 18

Effect of Certain Cobalamin Acids and Their Derivatives on Embryonic Development and Growth in the Chick. *Edward C. Naber and Jeremy F. Elliot* 28

The Importance of the Period of Dietary Restriction of the Dam on Behavior and Growth in the Rat. *Andie M. Hsueh, Maria Simonson, Bacon F. Chow and Harley M. Hanson* 37

Nucleic Acid and Polyamine Synthesis in the Rat during Short-term Protein Deficiency: Responsiveness of the Liver to Partial Hepatectomy. *Martti A. Siimes and Peter R. Dallman* 47

Nucleic Acid and Polyamine Synthesis in the Rat during Short-term Protein Deficiency: Responsiveness of the Bone Marrow and Liver to Blood Loss. *Martti A. Siimes and Peter R. Dallman* 59

Effect of Carbohydrate Load by Intravenous Infusion in Fasted Rats on Liver Glucose-6-phosphate Dehydrogenase and Malic Enzyme. *Robert F. Derr and Leslie Zieve* 65

Inhibitory Effect of Konjac Mannan on Bile Acid Transport in the Everted Sacs from Rat Ileum. *Shuhachi Kiriyama, Akiko Enishi and Kaoru Yura* 69

Relative Potency of Several Forms of α-Tocopherols in the Chick Liver Storage Bioassay. *L. D. Matterson and W. J. Pudelkiewicz* 79

Effect of a Low Protein Diet on Retention of an Oral Dose of ^{65}Zn and on Tissue Concentrations of Zinc, Iron, and Copper in Rats. *Darrell Van Campen and W. A. House* 84

Triglyceride Metabolism in Pyridoxine-deficient Rats. *André Audet and Paul J. Lupien* 91

Effects of Ethanol on the Transport of Manganese by Small Intestine of the Rat. *Daniel F. Schafer, David V. Stephenson, Anthony J. Barak and Michael F. Sorrell* 101

Chymotrypsinogen in the Intestine of Rats Fed Soybean Trypsin Inhibitor and Its Inability to Suppress Pancreatic Enzyme Secretions. *R. L. Lyman, Barbara A. Olds and Gary M. Green* 105

Early Postnatal Changes in Brain Composition in Progeny of Rats Fed Different Levels of Dietary Pyridoxine. *Regina L. Pang and Avanelle Kirksey* 111

Influence of Frequency of Feeding Low Protein Diets on Lipid Metabolism in Adult Rats Recovering from Malnutrition. *Robert D. Reeves and Lotte Arnrich* 118

Mineral Composition of the Whole Body, Liver and Bone of Young Horses. *H. F. Schryver, H. F. Hintz, J. E. Lowe, R. L. Hintz, R. B. Harper and J. T. Reid* 126

Genetic Influence on Response to Dietary Manganese Deficiency in Mice. *Lucille S. Hurley and Linda Theriault Bell* 133

Guide for Authors 138

Nomenclature Policy: Generic Descriptors and Trivial Names for Vitamins and Related Compounds 144

No. 2 FEBRUARY 1974

Effect of Abomasal Infusion of Sodium Caseinate on Milk Yield, Nitrogen Utilization and Amino Acid Nutrition of the Dairy Cow. *R. G. Derrig, J. H. Clark and C. L. Davis* 151

Effect of Dietary Cadmium on Growth, Cadmium Absorption and Cadmium Tissue Levels in Growing Lambs. *John J. Doyle, William H. Pfander, Stanley E. Grebing and James O. Pierce, II* 160

Interactions of Trace Metals in Rat Tissues. Cadmium and Nickel with Zinc, Chromium, Copper, Manganese. *Henry A. Schroeder and Alexis P. Nason* 167

Turnover of Taurine in Rat Tissues. *Donald G. Spaeth and Donald L. Schneider* 179

Influence of Dietary Fat and Di-2-ethylhexyl Phthalate on Tissue Lipids in Rats. *Michael S. Stein, Priscilla I. Caasi and Padmanabhan P. Nair* 187

Studies on Peroxidative Hemolysis and Erythrocyte Fatty Acids in the Rabbit: Effect of Dietary PUFA and Vitamin E. *Lynda R. Horn, Myra O. Barker, Gwendolyn Reed and Myron Brin* 192

Effect of Dietary 1,3-Butanediol on in vitro Fatty Acid Synthesis and Malic Enzyme Activity in Rat Liver and Adipose Tissue. *Dale R. Romsos, C. Sasse and Gilbert A. Leveille* 202

Effect of Prolonged Fasting on Carcass Composition and Blood Fatty Acids and Glucose of Neonatal Swine. *R. W. Seerley and D. R. Poole* 210

Effects of Food Restriction and Exercise upon the Deposition and Mobilization of Energy Stores in the Rat. *Albert W. Taylor, S. Cary, M. McNulty, J. Garrod and D. C. Secord* 218

Triglyceride Secretion Rates: Use of Triton WR 1339 in the Rhesus Monkey. *Robert H. Fiser, Jr., Joseph C. Denniston, Russell B. Rindsig and William R. Beisel* 223

Enzymatic Conversion of L- and D-Tryptophan to Kynurenine by Rat Liver. *Frank A. Rodden and Clarence P. Berg* 227

Life-term Effects of Nickel in Rats: Survival, Tumors, Interactions with Trace Elements and Tissue Levels. *Henry A. Schroeder, Marian Mitchener and Alexis P. Nason* .. 239

Sulfur Utilization by the Chick with Emphasis on the Effect of Inorganic Sulfate on the Cystine–Methionine Interrelationship. *Charles E. Sasse and David H. Baker* .. 244

Liver Polysome Profiles and Protein Synthesis in Rats Fed a Threonine-imbalanced Diet. *Clement C. Y. Ip and Alfred E. Harper* 252

Effect of Feeding Carbohydrate or Fat on Incorporation of ^{14}C-Phenylalanine in vivo and in vitro into Rat Liver and Muscle Protein. *Kiwao Nakano, Tomozo Ando and Kiyoshi Ashida* 264

Letters 272

No. 3 MARCH 1974

Effects of Various Feeding and Exercise Regimens on Rat Growth and Survival. *James D. Yager, Jr., Michael J. Lichtenstein, Robert J. Bonney, Harold A. Hopkins, P. Roy Walker, Carl G. Dorn and Van R. Potter* 273

Amino Acid Metabolism in Rats Fed a High Protein Diet without Pyridoxine. *Mitsuko Okada and Kazuhiko Suzuki* 287

Effect of Galactose–Ethanol Feeding on Growth in Rats. *S. Keiding, N. Keiding and N. Tygstrup* 294

Effect of Essential Fatty Acid Deficiency on Amino Acid Uptake by the Small Intestine of Rats. *John T. Johns and Werner G. Bergen* 300

Relative Toxicities of Selenite and Selenate in the Drinking Water of Rats. *I. S. Palmer and O. E. Olson* 306

Effect of Dietary Biotin and Lipid on Growth, Stamina, Lipid Metabolism and Biotin-containing Enzymes in Brook Trout (*Salvelinus fontinalis*). *Hugh A. Poston and and Thomas H. McCartney* 315

Pathological Changes Produced in Japanese Quail by Ingestion of Cadmium. *Mary E. Richardson, M. R. Spivey Fox and Bert E. Fry, Jr.* 323

Uptake of L-Arginine and L-Lysine by the Small Intestine and Its Influence on Arginine–Lysine Antagonism in Chicks. *R. Kadirvel and F. H. Kratzer* 339

MONOGRAPH: A Conspectus of Research on Zinc Requirements of Man. *James A. Halsted, J. Cecil Smith, Jr., and M. Isabel Irwin* 345

No. 4 APRIL 1974

Effects of High Grain Feeding and Stage of Lactation on Serum Insulin, Glucose and Milk Fat Percentage in Lactating Cows. *Bruce F. Jenny, Carl E. Polan and Forrest W. Thye* 379

Plasma Amino Acids and Stomach Contents of Rats Fed Casein and the Corresponding Amino Acid Mixture. *Hiroshi Itoh, Tetsuya Kishi and Ichiro Chibata* 386

Effect of Feeding "Carbohydrate-free" Diets on the Chick's Requirement for Vitamin B-12. *Su Hoon Looi and Ruth Renner* 394

Effect of Feeding "Carbohydrate-free" Diets on the Chick's Requirement for Methionine. *Su Hoon Looi and Ruth Renner* 400

Rat Liver DNA Synthesis during the "Catch-up" Growth of Nutritional Rehabilitation. *Hector G. Jasper and Jo Anne Brasel* 405

Effect of Dietary Free Gossypol on Blood Components and Tissue Iron in Swine and Rats. *Charles L. Skutches, D. L. Herman and F. H. Smith* 415

Hypervitaminosis D and Glycosaminoglycan Metabolism in Rats Fed Normal and High Fat Cholesterol Diets. *S. T. Vijayakumar and P. A. Kurup* 423

Fatty Acid Compositions of Bovine Adipose Tissue and of in vitro Lipogenesis. *Marvin A. Pothoven, Donald C. Beitz and Ann Zimmerli* 430

Effect of Zinc on Lipid Peroxidation and Metal Content in Some Tissues of Rats. *Milos Chvapil, Yei Mei Peng, Arthur L. Aronson and Charles Zukoski* 434

Response of Glutathione Peroxidase to Dietary Selenium in Rats. *Ching K. Chow and Al L. Tappel* 444

Total Fasting and Total Fasting Plus Exercise: Effects on Body Composition of the Rat. *Stephen P. Babirak, Russell T. Dowell and Lawrence B. Oscai* 452

Binding of Bile Salts in vitro by Nonnutritive Fiber. *David Kritchevsky and Jon A. Story* 458

Alterations in Cardiac Protein Metabolism in Rats Force-fed a Threonine-devoid Diet. *Ethel Verney and Herschel Sidransky* 463

Mannoheptulose and Fatty Acid Synthesis in the Rat. *George J. Klain and A. Wayne Meikle* 473

Effect of Vitamin A Intoxication on Intracranial Pressure and Brain Water in Rats. *Georgia W. Maddux, Floyd M. Foltz and Stanley R. Nelson* 478

Effect of the Consumption of Glycerides Containing Behenic Acid on the Lipid Contents of the Heart of Weanling Rats. *F. H. Mattson and J. A. Streck* 483

In vitro Phosphate Transport in Chick Ileum: Effect of Cholecalciferol, Calcium, Sodium and Metabolic Inhibitors. *Alan N. Taylor* 489

Plasma Threonine Response Curve and Threonine Requirements of Young Men and Elderly Women. *Kraisid Tontisirin, Vernon R. Young, William M. Rand and Nevin S. Scrimshaw* 495

No. 5 MAY 1974

Dilworth Wayne Woolley—A Biographical Sketch. *Thomas H. Jukes* 507

Maternal Dietary Deficiency and Cellular Development of Progeny in the Rat. *Uma Srivastava, My-Lien Vu and Tapas Goswami* 512

Protein Synthesis in the Skeletal Muscle of Vitamin E-deficient Rabbits. *Paulette Simard and Uma Srivastava* 521

Effect of Dietary Copper, Iron and Ascorbic Acid Levels on Hematology, Blood and Tissue Copper, Iron and Zinc Concentrations and ^{64}Cu and ^{59}Fe Metabolism in Young Pigs. *W. F. Gipp, W. G. Pond, F. A. Kallfelz, J. B. Tasker, D. R. Van Campen, L. Krook and W. J. Visek* 532

Urea Excretion in the Pig: An Indicator of Protein Quality and Amino Acid Requirements. *J. A. Brown and T. R. Cline* 542

Influence of Linoleate on Cholesterol Turnover in Rats. *Nobuko Iritani and Junko Nogi* 546

Utilization of Nitrogen from Selected Purines and Pyrimidines and from Urea by the Young Chick. *David H. Baker and Bruce A. Molitoris* 553

Evaluation of Commercial Rapeseed Meal and Bronowski Variety Rapeseed Meal in Calf Rations. *David J. Schingoethe, Gary L. Beardsley and Lawrence D. Muller* 558

Food Intake Regulation in the Weanling Rat: Self-selection of Protein and Energy. *Beverly Musten, Doryne Peace and G. Harvey Anderson* 563

Comparative Effects of Tallow, Lard and Soybean Oil, with and without Supplemental Cholesterol, on Growth, Tissue Cholesterol and Other Responses of Calves. *Norman L. Jacobson, Marlene Richard, P. Jeffrey Berger and John P. Kluge* 573

Effect of Dietary Selenium on Erythrocyte and Liver Glutathione Peroxidase in the Rat. *D. G. Hafeman, R. A. Sunde and W. G. Hoekstra* 580

Inositol Requirement of the Gerbil. *D. M. Hegsted, Anna Gallagher and Holly Hanford* 588

Reversal of Selenium Toxicity in Chicks by Mercury, Copper, and Cadmium. *C. H. Hill* 593

Development and Reversibility of Urolithiasis in Rats by Mineral Mixtures. *Edward E. Roginski and Walter Mertz* 599

Effect of Lactose on Δ^5-Steroid-reducing Activity of Intestinal Bacteria in Gnotobiotic Rats. *H. Eyssen, G. De Pauw and G. Parmentier* 605

Serum Lipid Changes Produced in Dogs by Substituting Coconut Oil for Either Sucrose or Protein in the Diet. *Francisco Grande and William F. Prigge* 613

Bioavailability of Different Sources of Dietary Iron Fed to Pitman-Moore Miniature Pigs. *Thomas A. Anderson, L. J. Filer, Jr., Samuel J. Fomon, Dean W. Andersen, Thomas L. Nixt, Ronald R. Rogers, Robert L. Jensen and Steven E. Nelson* 619

Lipid Content and Phospholipid Metabolism of Subcellular Fractions from Testes of Control and Retinol-deficient Rats. *R. F. Krause and K. C. Beamer* 629

Effect of Selenite on the Toxicity of Dietary Methyl Mercury and Mercuric Chloride in the Rat. *Susan Potter and Gennard Matrone* 638

Labeled Casein as an Indicator of Inhibited Protein Digestion in Chicks Fed Raw Soybean Meal. *Musha Tamir, Rachel Bielorai and Eugenia Alumot* 648

No. 6 JUNE 1974

Response of Lambs to Oral or Abomasal Supplementation of Methionine Hydroxy Analog or Methionine. *A. Papas, G. A. B. Hall, E. E. Hatfield and F. N. Owens* .. 653

Influence of Sex Hormones on Vitamin K Deficiency and Epoxidation of Vitamin K in the Rat. *John T. Matschiner and Allan K. Willingham* 660

Effect of Dietary Sulfur on Taurine Excretion by the Rat. *Betty Whittle and John T. Smith* 666

In vivo Intestinal Absorption of Hexose in Growth-related Suckling Rat Pups. *M. K. Younoszai and Arlene Lynch* 671

Citrulline Levels and Urea Cycle Enzymes in Uremic Rats. *Winnie Chan, Marian Wang, Joel D. Kopple and Marian E. Swendseid* 678

Studies on the Potassium Requirement of the Laying Hen. *R. M. Leach, Jr.* 684

Effect of Early Sucrose Feeding on the Metabolic Patterns of Mature Rats. *Phylis B. Moser and Carolyn D. Berdanier* 687

Effect of Protein Intake on Calcium Balance of Young Men Given 500 mg Calcium Daily. *Chander Rekha Anand and Hellen M. Linkswiler* 695

A Comparsion of the Effects of Dietary Protein and Lipid Deprivation on Lipid Composition of Liver Membranes in Rats. *Thomas Gerson* 701

Vitamin A Deficiency and the Glycoproteins of Rat Corneal Epithelium. *Yang-Cha Lee Kim and George Wolf* 710

Serum Lipids of Young Show Racer and White Carneau Pigeons Fed a Semipurified Diet with or without Cholesterol. *Franklin Young* 719

Studies on mRNA of the Livers of Rats Force-fed a Threonine-devoid or Complete Diet. *Herschel Sidransky, Ethel Verney and C. N. Murty* 726

Availability of Zinc from Pea Seeds to Rats. *Ross M. Welch, William A. House and William H. Allaway* 733

Effect of Dietary Fats and Fatty Acids on the Liver Lipid Accumulation Induced by Feeding a Protein-repletion Diet Containing Fructose to Protein-depleted Rats. *Yoritaka Aoyama, Akira Yoshida and Kiyoshi Ashida* 741

Effect of Dietary Selenium on Glutathione Peroxidase in the Chick. *Stanley T. Omaye and Al L. Tappel* 747

Urinary and Biliary Excretion of ^{14}C-Gossypol in Swine. *Mohamed B. Abou-Donia and Julius W. Dieckert* 754

Effect of Dietary Methionine Levels on Its Metabolism in Rats. *T. S. Aguilar, N. J. Benevenga and A. E. Harper* 761

Difficulties in Assessing the Nutritional Quality of Rice Protein. *D. Mark Hegsted and Bienvenido O. Juliano* 772

Significance of Dietary Carnitine for Growth and Carnitine Turnover in Rats. *Alan C. Tsai, Dale R. Romsos and Gilbert A. Leveille* 782

Utilization of Enzymatically Hydrolyzed Soybean Protein and Crystalline Amino Acid Diets by Rats with Exocrine Pancreatic Insufficiency. *Anthony R. Imondi and Roger P. Stradley* 793

No. 7 JULY 1974

Effects of Cholecalciferol on Bone Formation and Serum Calcium, Phosphate and Magnesium in Chicks. *Warren K. Ramp, Svein U. Toverud and Wayne A. Gonnerman* 803

Behavioral Patterns and Brain Nucleic Acid and Pyridoxal Phosphate Contents of Male Rat Progeny from Vitamin B-6-repleted Dams. *Judy A. Driskell and Donald P. Foshee* 810

Differential Effect of Gluten and Casein Diets on Rat Liver HMP Shunt Dehydrogenases. *Giovanni Carrozza, Gaetano Livrea, Luigi Manasseri and Ugo Muraca* .. 819

Effect of Zinc Deficiency during Lactation on Postnatal Growth and Development of Rats. *Patricia B. Mutch and Lucille S. Hurley* 828

Absorption of Amino Acids in Malnourished Rats. *Raul A. Wapnir and Fima Lifshitz* .. 843

Vitamin E Activity of γ-Tocopherol in the Rat, Chick and Hamster. *John G. Bieri and Ritva Poukka Evarts* 850

Metabolism of Albumin and Body Fluid Compartments in Protein Deficiency—an Experimental Study in the Rhesus Monkey. *M. G. Deo, A. K. Bhan and V. Ramalingaswami* 858

Effect of Vitamin A and Methionine on Growth and Amino Acid Composition of Body Protein in Rainbow Trout Fingerlings. *Curtis D. Eckhert and Arthur R. Kemmerer* 865

Vitamin A and Glycosaminoglycan Metabolism in Rats. *P. R. Sudhakaran and P. A. Kurup* 871

Production and Nutritional Evaluation of a High Lysine Baker's Yeast (*Saccharomyces cerevisiae*) in Rats. *Rodolfo F. Florentino and Harry P. Broquist* 884

Influence of Dietary Protein on 6- and 9-Desaturation of Fatty Acids in Rats of Different Ages and in Different Seasons. *Raúl O. Peluffo and Rodolfo R. Brenner* 894

In vivo and in vitro Utilization of Labeled Precursors for Choline Synthesis in Mature Japanese Quail as Compared to Rats. *R. P. S. Kushwaha and L. S. Jensen* 901

Influence of Fat and Fluoride on Gastric Emptying of Rats. *Evelyn L. McGown and John W. Suttie* 909

Reutilization of Guanido-labeled Arginine in Rat Liver Proteins and the Influence of Diet. *Joyce A. Nettleton and D. M. Hegsted* 916

Cartilage Matrix Components in Chickens with Tibial Dyschondroplasia. *Dennis A. Lowther, H. Clem Robinson, John W. Dolman and Keith W. Thomas* 922

Simple Method for Detecting Amylase Inhibitors in Biological Materials. *Kåre Fossum and John R. Whitaker* 930

Effects of Diet on Amaranth (FD & C Red No. 2) Toxicity in the Rat. *Benjamin H. Ershoff and Emory W. Thurston* 937

Effect of Dietary Galactose on Lysosomal Enzymes in the Chick. *Hartmut R. Schroeder, Jack R. Lawler and William W. Wells* 943

Studies on the Antiscorbutic Activity of Ascorbate 2-Sulfate in the Guinea Pig. *W. Kuenzig, R. Avenia and J. J. Kamm* 952

On the Repression of Rat Liver HMP Shunt Dehydrogenases by Wheat Gluten. *Gaetano Livrea, Giovanni Carrozza, Luigi Manasseri and Ugo Muraca* 957

Invitations for Nominations 962

No. 8 AUGUST 1974

EDITORIAL: "Nonessential" Amino Acids. *A. E. Harper* 965

Effect of Sex Hormones on Feed Intake in Rats. *Leonard S. Bull, Walter L. Hurley, Walter S. Kennett, Catherine B. Tamplin and Walter F. Williams* 968

Availability of Zinc in Leavened and Unleavened Wholemeal Wheaten Breads as Measured by Solubility and Uptake by Rat Intestine in vitro. *John G. Reinhold, Ali Parsa, Najafali Karimian, John W. Hammick and Faramarz Ismail-Beigi* 976

Iron Absorption by Humans from Veal Liver. *Carlos Martínez-Torres, Irene Leets, Martha Renzi and Miguel Layrisse* 983

Nutritional Adaptation after Small Bowel Resection in Rats. *Eleanor A. Young and Elliot Weser* 994

Deprivation of Amino Acids and Prenatal Brain Development in Rats. *S. Zamenhof, S. M. Hall, L. Grauel, E. Van Marthens and M. J. Donahue* 1002

Changes in Food Intake and Nitrogen Metabolism of Rats While Adapting to a Low or High Protein Diet. *Yeh-shan Peng, Larry L. Meliza, Mitchell G. Vavich and Arthur R. Kemmerer* 1008

Effect of Glycine and Serine in Synthetic Amino Acid Diets upon Glycine and Serine Metabolism in Chicks. *C. N. Coon, L. W. Luther and J. R. Couch* 1018

Malabsorption of Thiamin in Folate-deficient Rats. *Lyn Howard, Conrad Wagner and Steven Schenker* 1024

Effect of Dietary Energy vs. Protein Restriction on Blood Constituents and Reproductive Performance in Swine. *T. Atinmo, W. G. Pond and R. H. Barnes* 1033

Catabolism and Tissue Levels of Ascorbic Acid following Long-term Massive Doses in the Guinea Pig. *Donna I. Sorensen, Marjorie M. Devine and Jerry M. Rivers* 1041

Gluconeogenesis in Ruminants: Glucose Kinetic Parameters in Calves under Standardized Conditions. *Jerry W. Young, David R. Trott, P. Jeffrey Berger, Stephen P. Schmidt and Jennifer A. Smith* 1049

Role of Vitamin D Metabolites in Phosphate Transport of Rat Intestine. *Tai C. Chen, Lou Castillo, Margaret Korycka-Dahl and Hector F. DeLuca* 1056

Functional Instability of Skeletal Muscle Ribosomes after Protein Restriction of Rats. *Per T. Omstedt and Alexandra von der Decken* 1061

Effect of Dietary Selenium and Autoxidized Lipids on the Glutathione Peroxidase System of Gastrointestinal Tract and Other Tissues in the Rat. *K. Reddy and Al L. Tappel* 1069

Relationship of Calcium to Reproductive Abnormalities in the Laying Hen (*Gallus domesticus*). *D. A. Roland, Sr., D. R. Sloan, H. R. Wilson and R. H. Harms* 1079

Effect of Soy Sterols on Intestinal Absorption and Secretion of Cholesterol and Bile Acids in the Chick. *D. Sklan, P. Budowski and S. Hurwitz* 1086

Growth Factors in the Fish Meal Component of Catfish Diets. *James W. Andrews and Jimmy W. Page* 1091

Letters 1097

Invitations for Nominations 1098

No. 9 SEPTEMBER 1974

Agnes Fay Morgan—A Biographical Sketch. *Ruth Okey* 1101

Altered Preference for Sodium Chloride, Anorexia, and Changes in Plasma and Urinary Zinc in Rats Fed a Zinc-deficient Diet. *S. D. McConnell and R. I. Henkin* 1108

Liver Storage of Vitamin A by Rats Fed Carrots in Various Forms. *James P. Sweeney and Anne C. Marsh.* 1115

Nitrogen Retention of Adult Human Subjects Fed Varying Quantities of Tryptophan. *Helen E. Clark, Wan Hee Moon, Jean L. Malzer, Diane F. Birt and Regina L. Pang* 1121

Arginine, Lysine and Glycine Interaction in the Nutrition of the Chick. *R. Kadirvel, Pran Vohra and F. H. Kratzer* 1127

Differential Utilization of Low and High Dietary Cholesterol by Cockerels Fed Medium-chain Triglycerides or Corn Oil. *Jay Kenney and Hans Fisher* 1135

Induction of Rapid, Synchronous Vitamin A Deficiency in the Rat. *Adrian J. Lamb, Piyaratana Apiwatanaporn and James A. Olson* 1140

Induction of Tyrosine Aminotransferase and Depression of Protein Synthesis in Rat Liver by a Tryptophan-free Mixture of Amino Acids. *Brigitte Pamart, Anik Girard-Globa and Geneviève Bourdel* 1149

Effect of Intrauterine Growth Retardation on the Biochemical Maturation of Brain Synaptosomes in the Rat. *Alfonso Bernal, Myriam Morales, Alfredo Feria-Velasco, Susana Chew and Adolfo Rosado* 1157

Effect of Varying the Dietary Level of Calcium on Plasma and Tissue Lipids of Rabbits. *James M. Iacono* 1165

Nutritional Quality of Oilseed Protein Isolates as Determined with Larvae of the Yellow Mealworm, *Tenebrio molitor* L. *G. R. F. Davis and F. W. Sosulski* 1172

Changes in Hepatic RNA Synthesis in the Starve–Refeed Response of the Rat. *Gerald D. Pfeifer and Bela Szepesi* 1178

Influence of Synthetic Conjugates of Cholic Acid on Cholesteremia in Rats. *Jon A. Story, Shirley A. Tepper and David Kritchevsky* 1185

Starvation and the Glycogen of the Brain and Vital Organs of the Rhesus Monkey. *Americo Rivera, Jr. and Jose Martinez-de Jesus* 1189

Hypocalcemia, Hyperparathyroidism and Bone Resorption in Rats Induced by Dietary Phosphate. *Ten-Lin Sie, H. H. Draper and R. Raines Bell* 1195

Duodenal Calcium Binding Protein in the Chick: A New Bioassay for Vitamin D. *Arie Bar and Robert H. Wasserman* 1202

Substitution of Five Essential Amino Acids by Their Alpha-keto Analogues in the Diet of Rats. *Kye-Wing Chow and Mackenzie Walser* 1208

Invitations for Nominations 1215

No. 10 OCTOBER 1974

Notice to Subscribers 1219

Influence of High Levels of Minerals on the Susceptibility of Chicks to *Salmonella gallinarum*. *C. H. Hill* 1221

Effects of Mannoheptulose on Lipid Metabolism of Rats. *Eunsook Koh and Carolyn D. Berdanier* 1227

Diurnal Patterns of DNA Synthesis in the Rat: Modification by Diet and Feeding Schedule. *Peter R. Dallman, Robert A. Spirito and Martti A. Siimes* 1234

Effect of Lithium upon Lipid Metabolism in Rats. *Alan I. Fleischman, Paul H. Lenz and Marvin L. Bierenbaum* 1242

Metabolic Characteristics of the Carbohydrate-sensitive BHE Strain of Rats. *Carolyn D. Berdanier* 1246

Quantitative Changes in DNA, RNA, and Protein Content of the Various Organs of the Young of Undernourished Female Rats. *Tapas Goswami, My-Lien Vu and Uma Srivastava* 1257

Effect of Essential Fatty Acid Deficiency on the Arrhenius Plot of Acetylcholinesterase from Rat Erythrocytes. *Bernabé Bloj, Roberto D. Morero and Ricardo N. Farias* 1265

Hyperlipidemia in Offspring of Iron-deficient Rats. *Helen A. Guthrie, Minodockht Froozani, Adria Rothman Sherman and George P. Barron* 1273

Role of Pancreas in Endogenous Zinc Excretion in the Bovine. *P. E. Stake, W. J. Miller, D. M. Blackmon, R. P. Gentry and M. W. Neathery* 1279

Tissue Cytochrome Oxidase Activity and Copper, Iron, and Pantothenic Acid Nutrition in the Growing Rat. *J. L. Evans and B. S. Brar* 1285

Dietary Requirements for Vitamin E and Selenium Measured at the Cellular Level in the Chick. *G. F. Combs, Jr. and M. L. Scott* 1292

Antioxidant Effects on Selenium and Vitamin E Function in the Chick. *G. F. Combs, Jr. and M. L. Scott* 1297

Studies in Mice on the Isolation and Characterization of Growth Inhibitiors from Soybeans. *David J. Schingoethe, Larry J. Tidemann and Joseph R. Uckert* 1304

Dietary Fluoride Intake in Man. *Dace Osis, Lois Kramer, Emilie Wiatrowski and Herta Spencer* 1313

Effects of Dietary Roughage on Cholesterol Absorption, Cholesterol Turnover and Steroid Excretion in the Rat. *Joanne Balmer and D. B. Zilversmit* 1319

Protein–Calorie Malnutrition in Young Miniature Swine: Brain Free Amino Acids. *Thomas M. Badger and Myron E. Tumbleson* 1329

Protein–Calorie Malnutrition in Young Miniature Swine: Serum Free Amino Acids. *Thomas M. Badger and Myron E. Tumbleson* 1339

Tryptophan and Methionine Metabolism of Adult Females as Affected by Vitamin B-6 Deficiency. *Heaja Kim Shin and Hellen M. Linkswiler* 1348

Organ Weights and Tyrosine Aminotransferase Levels in the Rat during Adaptation to Periodic Fasting. *Michael J. Lichtenstein, Van R. Potter and Alfred E. Harper* .. 1356

Proceedings of the Thirty-eighth Annual Meeting of The American Institute of Nutrition. Shelburne Hotel, Atlantic City, New Jersey, April 7–12, 1974 1365

No. 11 NOVEMBER 1974

Notice to Subscribers 1379

Changes in Muscle and Brain Electrolytes in Rats Fed Natural Imbalanced Diets. *S. Closa, M. L. Portela, M. E. Rio and J. C. Sanahuja* 1381

Utilization of Heated Soybean Protein Isolate as a Dietary Source of Methionine for Rats. *Michael Shemer and Edward G. Perkins* 1389

Evidence for Polypeptide Synthesis in the Caiman from Mixtures Deficient in Essential Amino Acids. *Roland A. Coulson and Jack D. Herbert* 1396

Induction of Tyrosine Transaminase Activity by Hydrocortisone in Vitamin B-6-deficient Rats. *Thomas Puskar and George P. Tryfiates* 1407

Interactions of Dietary α-Tocopherol, Oxidized Menhaden Oil and Ethoxyquin on Channel Catfish (*Ictalurus punctatus*). *Takeshi Murai and James W. Andrews* .. 1416

Comparative Effects of Oral and Parenteral Feeding on Pancreatic Enzymes in the Rat. *M. Lavau, R. Bazin and J. Herzog.* 1432

Effect of 1,3-Butanediol on Hepatic Fatty Acid Synthesis and Metabolite Levels in the Rat. *Dale R. Romsos, Panfilo S. Belo and Gilbert A. Leveille* 1438

A Method for Determining "True" Availability of Magnesium from Foodstuffs using Chickens. *W. Guenter and J. L. Sell* 1446

Interrelationships of Zinc and Copper Nutriture in the Rat. *L. Murthy, L. M. Klevay and H. G. Petering* 1458

Vitamin A and Lysosomal Stability in Rat Liver. *P. R. Sudhakaran and P. A. Kurup* .. 1466

An Examination of the Metabolism of Thiamin by Rat Liver Alcohol Dehydrogenase. *Ramesh R. Dalvi, Howerde E. Sauberlich and Robert A. Neal* 1476

Influence of Dietary Protein and Methionine Levels on the Requirement for Choline by Chickens. *H. G. Ketola and Malden C. Nesheim* 1484

Validation of an Extrinsic Iron Label in Monitoring Absorption of Nonheme Food Iron in Normal and Iron-deficient Rats. *E. R. Monsen* 1490

Sequential Renal Lipid Changes in Weanling Rats Fed a Choline-deficient Diet. *Alberto J. Monserrat, Eduardo A. Porta, Amiya K. Ghoshal and S. B. Hartman* 1496

Effect of Meal Frequency and Diet Composition on Glucose Tolerance in the Rat. *Dale R. Romsos and Gilbert A. Leveille* 1503

Vitamin A Deficiency and Reproduction in Rhesus Monkeys. *B. A. O'Toole, R. Fradkin, J. Warkany, J. G. Wilson and G. V. Mann* 1513

Effect of Zinc Deficiency from Day 18 of Gestation and/or during Lactation on the Development of Some Rat Brain Enzymes. *Joseph R. Prohaska, R. W. Luecke and and Robert Jasinski* 1525

No. 12 DECEMBER 1974

Notice to Subscribers 1533

A Geometry of Nutrition. *Parry Moon and Domina Eberle Spencer* 1535

Responses of Growing Lambs to Abomasal Infusion of Corn Oil, Starch, Casein, and Amino Acid Mixtures. *A. Papas, E. E. Hatfield and F. N. Owens* 1543

Effect of Cellulose and Cholesterol on Blood and Yolk Lipids and Reproductive Efficiency of the Hen. *H. Menge, L. H. Littlefield, L. T. Frobish and B. T. Weinland* 1554

Effect of Phenobarbital on the Level of Gossypol in the Liver and the Effect of Gossypol and Phenobarbital on Liver Microsomal *O*-Demethylation and Lipid Peroxidation Activities in the Rat. *Charles L. Skutches and F. H. Smith* 1567

Effect of Protein Nutrition on Growth, Longevity and Incidence of Lesions in the Rat. *Itsiro Nakagawa, Atsuko Sasaki, Masatoshi Kajimoto, Tomitaro Fukuyama, Taeko Suzuki and Eiko Yamada* 1576

Plasma and Tissue Free Amino Acid Concentrations in Rats Fed Tryptophan-imbalanced Diets with or without Niacin. *K. C. Pant, Q. R. Rogers and A. E. Harper*.. 1584

The Mechanism of a Specific Metabolic Effect of Sucrose in the Rat. *O. E. Michaelis, IV and B. Szepesi* 1597

Cellular Changes in the Exocrine Pancreas of Rats Fed Two Levels of Magnesium and Protein. *Janet Lee Greger and Ruth Schwartz* 1610

Subcellular Changes in Protein Metabolism and Magnesium Content of the Pancreas in Rats Fed Two Levels of Dietary Protein and Magnesium. *Janet Lee Greger and Ruth Schwartz* 1618

Nutritional Effects of Alkali-treated Soyprotein in Rats. *L. van Beek, V. J. Feron and A. P. de Groot* 1630

Effect of Vitamin E on δ-Aminolevulinic Acid Dehydratase Activity in Weanling Rabbits with Chronic Plumbism. *Richard S. Bartlett, J. E. Rousseau, Jr., H. I. Frier and R. C. Hall, Jr.* 1637

Response of Nitrogen Metabolism, Plasma Amino Acids and Insulin Levels to Various Levels of Methionine Infusion in Sheep. *Robert C. Tao, J. Malcolm Asplund and Leonard C. Kappel* 1646

Relationship between Glutamic Decarboxylase Activities in Brains and the Vitamin B-6 Requirement of Male Rats. *Judy A. Driskell and Shou-Lih Lee Chuang* 1657

The "Partial" Vitamin A Function of α-Retinol. *W. D. Sneider, G. Chi Rosso, Adrianne E. Rogers, George Wolf, J. E. Dowling and M. J. Callahan* 1662

Site of Carnitine Biosynthesis in the Rat. *Vichai Tanphaichitr and Harry P. Broquist.* 1669

Jejunal Uptake of Tritiated Folic Acid in the Rat Studied by in vivo Perfusion. *Charles H. Halsted, Kowit Bhanthumnavin and Esteban Mezey* 1674

Effect of Arginine Deficiency on Growth and Intermediary Metabolism in Rats. *J. A. Milner, A. E. Wakeling and W. J. Visek* 1681

Effects of Thiamin Deficiency and Thiamin Antagonists on Serum and Liver Cholesterol Levels and on Cholesterol Biosynthesis in Rats. *C. J. Gubler, J. W. Peterson, K. K. Turpin, L. W. Crane, L. G. W. Turner and M. Bennion* 1690

Erratum 1696

Index to Volume 104 1697

Index, Volume 104

A

Abomasal infusion of corn oil, starch, casein, and amino acid mixtures in growing lambs, 1543.

ABOU-DONIA, M. B., AND J. W. DIECKERT. Urinary and biliary excretion of ^{14}C-gossypol in swine, 754.

Absorption, intestinal, of hexose in growth-retarded suckling rat pups, 671.

Acetylcholinesterase from rat erythrocytes; effect of essential fatty acid deficiency on the Arrhenius plot of, 1265.

Adaptation, nutritional, after small bowel resection in rats, 994.

AGUILAR, T. S., N. J. BENEVENGA AND A. E. HARPER. Effect of dietary methionine levels on its metabolism in rats, 761.

Albumin, metabolism of, and body fluid compartments in protein deficiency in rhesus monkey, 858.

Alcohol dehydrogenase; an examination of the metabolism of thiamin by rat liver, 1476.

Alkali-treated soyprotein in rats; nutritional effects of, 1630.

ALLAWAY, W. H. See Welch, R. M., 733.

ALUMOT, E. See Tamir, M., 648.

Amaranth toxicity in the rat; effects of diet on, 937.

American Institute of Nutrition, proceedings, 38th annual meeting, 1974, 1365.

Amino acid(s) absorption in malnourished rats, 843.

——, deprivation of, and prenatal brain development in rats, 1002.

——, essential, mixtures deficient in; evidence for polypeptide synthesis in the caiman from, 1396.

——, essential; substitution of their α-keto analogues for, in the diet of rats, 1208.

—— metabolism in rats fed a high protein diet without pyridoxine, 287.

—— mixture free of tryptophan, induction of tyrosine aminotransferase and depression of protein synthesis in rat liver by, 1149.

——, "nonessential" (Editorial paper), 965.

——, plasma, and stomach contents of rats fed casein and the corresponding amino acid mixture, 386.

—— requirements of the pig indicated by urea excretion, 542.

—— uptake by rat small intestine; effect of on essential fatty acid deficiency, 300.

δ-Aminolevulinic acid dehydratase activity in weanling rabbits with chronic plumbism; effect of vitamin E on, 1637.

Amylase inhibitors; simple method for detecting, 930.

ANAND, C. R., AND H. M. LINKSWILER. Effect of protein intake on calcium balance of young men given 500 mg calcium daily, 695.

ANDERSEN, D. W. See Anderson, T. A., 619.

ANDERSON, G. H. See Musten, B., 563.

ANDERSON, T. A., L. J. FILER, JR., S. J. FOMON, D. W. ANDERSEN, T. L. NIXT, R. R. ROGERS, R. L. JENSEN AND S. E. NELSON. Bioavailability of different sources of dietary iron fed to Pitman-Moore miniature pigs, 619.

ANDO, T. See Nakano, K., 264.

ANDREWS, J. W., AND J. W. PAGE. Growth factors in the fish meal component of catfish diets, 1091.

———. See Murai, T., 1416.

Anorexia, altered preference for sodium chloride, and changes in plasma and urinary zinc in rats fed a zinc-deficient diet, 1108.

Antiscorbutic activity of ascorbate 2-sulfate in the guinea pig, 952.

AOYAMA, Y., A. YOSHIDA AND K. ASHIDA. Effect of dietary fats and fatty acids on the liver lipid accumulation induced by feeding a protein-repletion diet containing fructose to protein-depleted rats, 741.

APIWATANAPORN, P. See Lamb, A. J., 1140.

Appetite regulation in the weanling rat: self-selection of protein and energy, 563.

ARGENZIO, R. A., J. E. LOWE, H. F. HINTZ AND H. F. SCHRYVER. Calcium and phosphorus homeostasis in horses, 18.

Arginine deficiency; effect of on growth and intermediary metabolism in rats, 1681.

—, guanido labeled; reutilization of in rat liver proteins and the influence of diet, 916.

—, lysine and glycine interaction in the nutrition of the chick, 1127.

L-Arginine and L-lysine; intestinal uptake of by the chick, 339.

ARNRICH, L. See Reeves, R. D., 118.

ARONSON, A. L. See Chvapil, M., 434.

Arrhenius plot of acetylcholinesterase from rat erythrocytes; effect of essential fatty acid deficiency on, 1265.

Ascorbate 2-sulfate in the guinea pig; antiscorbutic activity of, 952.

Ascorbic acid catabolism and tissue levels following long-term massive doses in the guinea pig, 1041.

——, copper and iron in diet; effects on iron utilization of young pigs, 532.

ASHIDA, K. See Aoyama, Y., 741.

———. See Nakano, K., 264.

ASPLUND, J. M. See Tao, R. C., 1646.

ATINMO, T., W. G. POND AND R. H. BARNES. Effect of dietary energy vs. protein restriction on blood constituents and reproductive performance in swine, 1033.

AUDET, A., AND P. J. LUPIEN. Triglyceride metabolism in pyridoxine-deficient rats, 91.

Availability, biological, of zinc from pea seeds to rats, 733.

AVENIA, R. See Kuenzig, W., 952.

8-Azaguanine insensitive induction in rats of glucose-6-phosphate dehydrogenase following transfer from 90% carbohydrate to 90% protein diet, induction of G6PD by a 90% carbohydrate diet and, 12.

B

Babirak, S. P., R. T. Dowell and L. B. Oscai. Total fasting and total fasting plus exercise: effects on body composition of the rat, 452.

Badger, T. M., and M. E. Tumbleson. Protein–calorie malnutrition in young miniature swine: brain free amino acids, 1329.

———, and ———. Protein–calorie malnutrition in young miniature swine: serum free amino acids, 1339.

Baker, D. H., and B. A. Molitoris. Utilization of nitrogen from selected purines and pyrimidines and from urea by the young chick, 553.

———. See Sasse, C. E., 244.

Balmer, J., and D. B. Zilversmit. Effects of dietary roughage on cholesterol absorption, cholesterol turnover and steroid excretion in the rat, 1319.

Bar, A., and R. H. Wasserman. Duodenal calcium binding protein in the chick: a new bioassay for vitamin D, 1202.

Barak, A. J. See Schafer, D. F., 101.

Barker, M. O. See Horn, L. R., 192.

Barnes, R. H. See Atinmo, T., 1033.

Barron, G. P. See Guthrie, H. A., 1273.

Bartlett, R. S., J. E. Rousseau, Jr., H. I. Frier and R. C. Hall, Jr. Effect of vitamin E on δ-aminolevulinic acid dehydratase activity in weanling rabbits with chronic plumbism, 1637.

Bazin, R. See Lavau, M., 1432.

Beamer, K. C. See Krause, R. F., 629.

Beardsley, G. L. See Schingoethe, D. J., 558.

Behavior and growth in the rat; importance of the period of dietary restriction of the dam on, 37.

— patterns and brain components of male rat progeny from vitamin B-6-repleted dams, 810.

Behenic acid, consumption of; effect on lipid content of the heart of weanling rats, 483.

Beisel, W. R. See Fiser, R. H., Jr., 223.

Beitz, D. C. See Pothoven, M. A., 430.

Bell, L. T. See Hurley, L. S., 133.

Bell, R. R. See Sie, T.-L., 1195.

Belo, P. S. See Romsos, D. R., 1438.

Benevenga, N. J. See Aguilar, T. S., 761.

Bennion, M. See Gubler, C. J., 1690.

Berdanier, C. D. Metabolic characteristics of the carbohydrate-sensitive BHE strain of rats, 1246.

———. See Koh, E., 1227.

———. See Moser, P. B., 687.

Berg, C. P. See Rodden, F. A., 227.

Bergen, W. G. See Johns, J. T., 300.

Berger, P. J. See Jacobson, N. L., 573.

———. See Young, J. W., 1049.

Bernal, A., M. Morales, A. Feria-Velasco, S. Chew and A. Rosado. Effect of intrauterine growth retardation on the biochemical maturation of brain synaptosomes in the rat, 1157.

Bhan, A. K. See Deo, M. G., 858.

Bhanthumnavin, K. See Halsted, C. H., 1674.

Bielorai, R. See Tamir, M., 648.

Bierenbaum, M. L. See Fleischman, A. I., 1242.

Bieri, J. G., and R. P. Evarts. Vitamin E activity of γ-tocopherol in the rat, chick and hamster, 850.

Bile acid transport in the everted sacs from rat ileum; inhibitory effect of konjac mannan on, 69.

— salts, binding of in vitro by nonnutritive fiber, 458.

Bioavailability of different sources of dietary iron fed to Pitman-Moore miniature pigs, 619.

Biographies: Maynard, Leonard Amby, 1; Morgan, Agnes Fay, 1101; Woolley, Dilworth Wayne, 507.

Biosynthesis, carnitine; site of in the rat, 1669.

Biotin and fat interrelationships in brook trout, 315.

Birt, D. F. See Clark, H. E., 1121.

Blackmon, D. M. See Stake, P. E., 1279.

Bloj, B., R. D. Morero and R. N. Farías. Effect of essential fatty acid deficiency on the Arrhenius plot of acetylcholinesterase from rat erythrocytes, 1265.

Blood loss in rat; response of bone marrow and liver nucleic acid and polyamine synthesis in short-term protein deficiency to, 59.

Bone formation and serum calcium, phosphate and magnesium in chicks; effects of cholecalciferol on, 803.

— marrow and liver in rat; response of nucleic acid and polyamine synthesis in to blood loss in protein deficiency, 59.

Bonney, R. J. See Yager, J. D., Jr., 273.

Bourdel, G. See Pamart, B., 1149.

Bovine adipose tissue, fatty acid composition of and of in vitro lipogenesis, 430.

—; role of pancreas in endogenous zinc excretion in, 1279.

Brain composition in progeny of rats fed different levels of pyridoxine, early postnatal changes in, 111.

— development, prenatal, in rats; deprivation of amino acids and, 1002.

— enzymes of rats; effect of zinc deficiency from day 18 of gestation and/or during lactation on development of, 1525.

— free amino acids of young miniature swine as affected by protein–calorie malnutrition, 1329.

— of male rats; relationship between glutamate decarboxylase activities and the vitamin B-6 requirement of, 1657.

— and muscle electrolytes in rats; changes in as affected by natural imbalanced diets, 1381.

— water and intracranial pressure in rats; effect of vitamin A intoxication on, 478.

Brar, B. S. See Evans, J. L., 1285.

Brasel, J. A. See Jasper, H. G., 405.

Bread, leavened and unleavened wholemeal wheaten; availability of zinc in, 976.

Brenner, R. R. See Peluffo, R. O., 894.

Briggs, G. M. Letters to the editor: thiamin deficiency, 272.

Brin, M. See Horn, L. R., 192.

Broquist, H. P. See Florentino, R. F., 884.

———. See Tanphaichitr, V., 1669.

Brown, J. A., and T. R. Cline. Urea excretion in the pig: an indicator of protein quality and amino acid requirements, 542.

Budowski, P. See Sklan, D., 1086.

Bull, L. S., W. L. Hurley, W. S. Kennett, C. B. Tamplin and W. F. Williams. Effect of six hormones on feed intake in rats, 968.

1,3-Butanediol, dietary; effect on in vitro fatty acid synthesis and malic enzyme activity in rat liver and adipose tissue, 202.

—; effect of on hepatic fatty acid synthesis and metabolite levels in the rat, 1438.

C

Caasi, P. I. See Stein, M. S., 187.
Cadmium, dietary; effect of growth, cadmium absorption and tissue levels in growing lambs, 160.
—, mercury and copper; reversal of selenium toxicity in chicks by, 593.
— and nickel; interactions with zinc, chromium, copper and manganese in rat tissues, 167.
— pathology in Japanese quail, 323.
Caiman; evidence for polypeptide synthesis in from mixtures deficient in essential amino acids, 1396.
Calcium balance of young men given 500 mg calcium daily; effect of protein intake on, 695.
— binding protein, duodenal: a new bioassay for vitamin D, 1202.
— deficiency in plasma of rats, bone resorption and hyperparathyroidism induced by dietary phosphate, 1195.
—, dietary level of; effect of varying on plasma and tissue lipids of rabbits, 1165.
—, phosphate and magnesium in chick serum and bone formation; effects of cholecalciferol on, 803.
— and phosphorus homeostasis in horses, 18.
—, relationship of to reproductive abnormalities in the laying hen, 1079.
Calf, comparative effects of tallow, lard and soybean oil, with and without cholesterol, on growth, tissue cholesterol and other responses of, 573.
— ration; evaluation of commercial and Bronowski variety rapeseed meal in, 558.
Callahan, M. J. See Sneider, W. D., 1662.
Calorie and Joule (Letters to the Editor), 1097.
Calves; glucose kinetic parameters in, 1049.
Carbohydrate or fat; effect on incorporation of ^{14}C-phenylalanine in vivo and in vitro into rat liver and muscle protein, 264.
— -free diets; effect on the chick's requirement for methionine, 400.
— -free diets; effect on the chick's requirement for vitamin B-12, 394.
— -sensitive BHE strain of rats; metabolic characteristics of, 1246.
Carnitine biosynthesis; site of in the rat, 1669.
—, dietary; significance of for growth and carnitine turnover in rats, 782.
Carrots, in various forms; liver storage of vitamin A by rats fed, 1115.
Carrozza, G., G. Livrea, L. Manasseri and U. Muraca. Differential effect of gluten and casein diets on rat liver HMP shunt dehydrogenases, 819.
———. See Livrea, G., 957.
Cartilage matrix components in chickens with tibial dyschondroplasia, 922.
Cary, S. See Taylor, A. W., 218.
Casein and gluten diets; differential effects on rat liver HMP shunt dehydrogenases, 819.
Castillo, L. See Chen, T. C., 1056.
Catch-up growth of nutritional rehabilitation; rat liver DNA synthesis during, 405.
Catfish, channel (*Ictalurus punctatus*); interactions of dietary α-tocopherol, oxidized menhaden oil and ethoxyquin on, 1416.
— diets; growth factors in the fish meal component of, 1091.
Cell development and composition of the young of underfed rats, 512.
Cellulose and cholesterol; effects of on blood and yolk lipids and reproductive efficiency of the hen, 1554.
Chan, W., M. Wang, J. D. Kopple and M. E. Swendseid. Citrulline levels and urea cycle enzymes in uremic rats, 678.
Chandler, A. M. See Mack, D. O., 12.
Chen, T. C., L. Castillo, M. Korycka-Dahl and H. F. DeLuca. Role of vitamin D metabolites in phosphate transport of rat intestine, 1056.
Chew, S. See Bernal, A., 1157.
Chibata, I. See Itoh, H., 386.
Chick(s); antioxidant effects on selenium and vitamin E function in, 1297.
—; arginine, lysine and glycine interaction in the nutrition of, 1127.
—; dietary requirements for vitamin E and selenium measured at the cellular level in, 1292.
—, differential utilization of low and high cholesterol by cockerels fed medium-chain triglycerides or corn oil, 1135.
—; effect of certain cobalamin acids and their derivatives on embryonic development and growth in, 28.
—; effect of dietary galactose on lysosomal enzymes in, 943.
—; effect of dietary selenium on glutathione peroxidase in, 747.
—; effect of feeding carbohydrate-free diets on the methionine requirement of the, 400.
—; effect of feeding carbohydrate-free diets on vitamin B-12 requirement of the, 394.
—; effect of glycine and serine in synthetic amino acid diets upon glycine and serine metabolism in chicks, 1018.
—; effect of inorganic sulfate on the cystine–methionine interrelationship in, 244.
—; effect of soy sterols on intestinal absorption and secretion of cholesterol and bile acids in, 1086.
—; effects of cholecalciferol on bone formation and serum calcium, phosphate and magnesium in, 803.
— ileum, phosphate transport in; effect of cholecalciferol, calcium, sodium and other metabolic inhibitors, 489.
—, rat and hamster; vitamin E activity of γ-tocopherol in, 850.
—; reversal of selenium toxicity in by mercury, copper and cadmium, 593.
—; susceptibility of to *Salmonella gallinarum*; effects of high levels of minerals on, 1221.
—; uptake of L-arginine and L-lysine by the small intestine and its influence on arginine–lysine antagonism in, 339.
—; utilization of nitrogen from selected purines and pyrimidines and from urea by, 553.
Chicken(s); influence of dietary protein and methionine levels on the requirement for choline by, 1484.
—; a method for determining "true" availability of magnesium from foodstuffs using, 1446.
—, potassium requirement of laying, 684.
—, relationship of calcium to reproductive abnormalities in the laying hen, 1079.
— with tibial dyschondroplasia, cartilage matrix components in, 922.

Cholecalciferol, calcium, sodium and other metabolic inhibitors; effect on in vitro phosphate transport in chick ileum, 489.
—; effects of on bone formation and serum calcium, phosphate and magnesium in chicks, 803.
Cholesteremia in rats; effect of synthetic conjugates of cholic acid on, 1185.
Cholesterol, absorption and turnover, and steroid excretion in the rat; effects of dietary roughage on, 1319.
— and bile acids in the chick, intestinal absorption and secretion of; effect of soy sterols on, 1086.
— and cellulose; effects of on blood and yolk lipids and reproductive efficiency of the hen, 1554.
— conversion into coprostanol by intestinal bacteria in germfree rats; effect of lactose on, 605.
— in diet of rat; interaction with hypervitaminosis D and glycosaminoglycan metabolism, 423.
—, dietary; serum lipids of young Show Racer and White Carneau pigeons fed a semipurified diet with or without, 719.
—, low and high dietary; differential utilization of by cockerels fed medium-chain triglycerides or corn oil, 1135.
—; serum and liver levels of in rats as affected by thiamin deficiency and thiamin antagonists, 1690.
—, tissue, and other responses of calves; comparative effects of tallow, lard and soybean oil, with and without, 573.
— turnover in rats; influence of linoleate on, 546.
Cholic acid, synthetic conjugates of; effect on cholesteremia in rats, 1185.
Choline-deficient diet; sequential renal lipid changes in weanling rats fed a, 1496.
Choline; requirement by chickens; influence of dietary protein and methionine levels on the, 1484.
— synthesis in mature Japanese quail as compared to rats; in vivo and in vitro utilization of labeled precursors for, 901.
Chow, B. F. See Hsueh, A. M., 37.
Chow, C. K., and A. L. Tappel. Response of glutathione peroxidase to dietary selenium in rats, 444.
Chow, K.-W., and M. Walser. Substitution of five essential amino acids by their alpha-keto analogues in the diet of rats, 1208.
Chuang, S.-L. L. See Driskell, J. A., 1657.
Chvapil, M., Y. M. Peng, A. L. Aronson and C. Zukoski. Effect of zinc on lipid peroxidation and metal content in some tissues of rats, 434.
Chymotrypsinogen in the intestine of rats fed soybean trypsin inhibitor and its inability to suppress pancreatic enzyme secretions, 105.
Citrulline levels and urea cycle enzymes in uremic rats, 678.
Clark, H. E., W. H. Moon, J. L. Malzer, D. F. Birt and R. L. Pang. Nitrogen retention of adult human subjects fed varying quantities of tryptophan, 1121.
Clark, J. H. See Derrig, R. G., 151.
Cline, T. R. See Brown, J. A., 542.
Closa, S., M. L. Portela, M. E. Rio and J. C. Sanahuja. Changes in muscle and brain electrolytes in rats fed natural imbalanced diets, 1381.
Coconut oil substituted for either sucrose or protein in the dog's diet, serum lipid changes produced by, 613.
Combs, G. F., Jr., and M. L. Scott. Antioxidant effects on selenium and vitamin E function in the chick, 1297.
——— and ———. Dietary requirements for vitamin E and selenium measured at the cellular level in the chick, 1292.
Coon, C. N., L. W. Luther and J. R. Couch. Effect of glycine and serine in synthetic amino acid diets upon glycine and serine metabolism in chicks, 1018.
Copper, iron and ascorbic acid in diet; effect on hematology, blood and tissue copper, iron and zinc, and on ^{64}Cu and ^{59}Fe metabolism in young pigs, 532.
—, iron, and pantothenic acid nutrition and tissue cytochrome oxidase activity in the growing rat, 1285.
—, iron and zinc concentrations in rat tissues; effect of a low protein diet on retention of ^{65}Zn and on, 84.
—, mercury and cadmium, reversal of selenium toxicity in chick by, 593.
— and zinc nutriture interrelationships in the rat, 1458.
Cornea epithelium of rat; vitamin A deficiency and the glycoproteins of, 710.
Couch, J. R. See Coon, C. N., 1018.
Coulson, R. A., and J. D. Herbert. Evidence for polypeptide synthesis in the caiman from mixtures deficient in essential amino acids, 1396.
Cow(s), dairy; effect of abomasal infusion of sodium caseinate on milk yield, nitrogen utilization and amino acid nutrition of, 151.
—, lactating; effects of high grain feeding and stage of lactation on serum insulin, glucose and milk fat percentage in, 379.
Crane, L. W. See Gubler, C. J., 1690.
Cystine and methionine interrelationship in the chick; effect of inorganic sulfate on, 244.

D

Dallman, P. R., R. A. Spirito and M. A. Siimes. Diurnal patterns of DNA synthesis in the rat: modification by diet and feeding schedule, 1234.
———. See Siimes, M. A., 47, 59.
Dalvi, R. R., H. E. Sauberlich and R. A. Neal. An examination of the metabolism of thiamin by rat liver alcohol dehydrogenase, 1476.
Davis, C. L. See Derrig, R. G., 151.
Davis, G. R. F., and F. W. Sosulski. Nutritional quality of oilseed protein isolates as determined with larvae of the yellow mealworm, *Tenebrio molitor* L., 1172.
de Groot, A. P. See van Beek, L., 1630.
DeLuca, H. F. See Chen, T. C., 1056.
Denniston, J. C. See Fiser, R. H., Jr., 223.
Deo, M. G., A. K. Bhan and V. Ramalingaswami. Metabolism of albumin and body fluid compartments in protein deficiency—an experimental study in the rhesus monkey, 858.
De Pauw, G. See Eyssen, H., 605.
Derr, R. F., and L. Zieve. Effect of carbohydrate load by intravenous infusion in fasted rats on liver glucose-6-phosphate dehydrogenase and malic enzyme, 65.

DERRIG, R. G., J. H. CLARK AND C. L. DAVIS. Effect of abomasal infusion of sodium caseinate on milk yield, nitrogen utilization and amino acid nutrition of the dairy cow, 151.
Desaturation of fatty acids in rats of different ages and in different seasons; effect of dietary protein on, 894.
Development and growth of rats; effect of zinc deficiency during lactation on, 828.
DEVINE, M. M. See Sorensen, D. I., 1041.
DIECKERT, J. W. See Abou-Donia, M. B., 754.
Dietary restriction of the dam; importance of the period of on behavior and growth of offspring, 37.
Diet composition and meal frequency; effect on glucose tolerance in the rat, 1503.
Di-2-ethylhexyl phthalate and dietary fat, influence on tissue lipids in rats, 187.
Digestibility, inhibited, of the protein in raw soybean meal fed to chicks, labeled casein as an indicator of, 648.
DNA, RNA, and polyamine synthesis in rat liver and bone marrow after partial hepatectomy with protein malnutrition, 47.
—, RNA, and protein content; quantitative changes of in various organs of the young of undernourished female rats, 1257.
— synthesis in the rat, diurnal patterns of: modification by diet and feeding schedule, 1234.
— synthesis in rat liver during the "catch-up" growth of nutritional rehabilitation, 405.
Dog, serum lipid changes produced in by substituting coconut oil for either sucrose or protein in the diet, 613.
DOLMAN, J. W. See Lowther, D. A., 922.
DONAHUE, M. J. See Zamenhof, S., 1002.
DORN, C. G. See Yager, J. D., Jr., 273.
DOWELL, R. T. See Babirak, S. P., 452.
DOWLING, J. E. See Sneider, W. D., 1662.
DOYLE, J. J., W. H. PFANDER, S. E. GREBING AND J. O. PIERCE, II. Effect of dietary cadmium on growth, cadmium absorption and cadmium tissue levels in growing lambs, 160.
DRAPER, H. H. See Sie, T.-L., 1195.
DRISKELL, J. A., AND S.-L. L. CHUANG. Relationship between glutamate decarboxylase activities in brains and the vitamin B-6 requirement of male rats, 1657.
———, AND D. P. FOSHEE. Behavioral patterns and brain nucleic acid and pyridoxal phosphate contents of male rat progeny from vitamin B-6-repleted dams, 810.
Dyschondroplasia, tibial, in chickens; studies of cartilage abnormalities in, 922.

E

ECKHERT, C. D., AND A. R. KEMMERER. Effect of vitamin A and methionine on growth and amino acid composition of body protein in rainbow trout fingerlings, 865.
Editorial paper: A. E. Harper, "Nonessential" amino acids, 965.
Electrolytes, brain and muscle; changes in as affected by natural imbalanced diets in rats, 1381.
ELLIOT, J. F. See Naber, E. C., 28.
Embryonic development and growth in the chick; effect of certain cobalamin acids and their derivatives on, 28.
Energy and protein: self-selection of in the weanling rat, 563.
— stores in the rat, deposition and mobilization of; effects of food restriction and exercise on, 218.
ENISHI, A. See Kiriyama, S., 69.
Enzymes, lysosomal, in the chick; effect of dietary galactose on, 943.
—, pancreatic, in the rat; comparative effects of oral and parenteral feeding on, 1432.
—, rat brain; effect of zinc deficiency from day 18 of gestation and/or during lactation on development of some, 1525.
Epoxidation of vitamin K in the rat; influence of sex hormones on vitamin K deficiency and, 660.
ERSHOFF, B. H., AND E. W. THURSTON. Effects of diet on amaranth (FD & C red no. 2) toxicity in the rat, 937.
Erythrocyte, effect of dietary selenium on, and on liver glutathione peroxidase in rat, 580.
Essential fatty acid deficiency; effect on amino acid uptake by rat small intestine, 300.
————; effect on the Arrhenius plot of acetylcholinesterase from rat erythrocytes, 1265.
Ethanol and galactose feeding; effect on rat growth, 294.
— and intestinal transport of manganese in the rat, 101.
Ethoxyquin, dietary α-tocopherol and oxidized menhaden oil interactions in channel catfish (*Ictalurus punctatus*), 1416.
EVANS, J. L., AND B. S. BRAR. Tissue cytochrome oxidase activity and copper, iron, and pantothenic acid nutrition in the growing rat, 1285.
EVARTS, R. P. See Bieri, J. G., 850.
Exercise; effects on body composition of rat of total fasting and total fasting plus, 452.
— and feeding regimens, various; effects on rat growth and survival, 273.
— and food restriction in rat; effects of on the deposition and mobilization of energy stores, 218.
EYSSEN, H., G. DE PAUW AND G. PARMENTIER. Effect of lactose on Δ^5-steroid-reducing activity of intestinal bacteria in gnotobiotic rats, 605.

F

FARÍAS, R. N. See Bloj, B., 1265.
Fasting, prolonged; effect on carcass composition and blood fatty acids and glucose of neonatal swine, 210.
—, total, with and without exercise: effects on body composition of rat, 452.
Fat(s) and biotin interrelationships in brook trout, 315.
— or carbohydrate; effect on incorporation of ^{14}C-phenylalanine in vivo and in vitro into rat liver and muscle protein, 264.
—, dietary, with and without cholesterol; comparative effects of on tissue cholesterol and other responses of calves, 573.
— and di-2-ethylhexyl phthalate, dietary; effect on tissue lipids in rats, 187.
— and fatty acids, dietary; effect on liver lipid accumulation induced by feeding a protein-repletion diet containing fructose to protein-depleted rats, 741.
— and fluoride; influence on gastric emptying of rats, 909.

Fatty acid composition of bovine adipose tissue and of in vitro lipogenesis, 430.
— — desaturation in rats of different ages and in different seasons; effect of dietary protein on, 894.
— — synthesis, hepatic, and metabolite levels in the rat as affected by 1,3-butanediol, 1438.
— — synthesis and malic enzyme activity in rat liver and adipose tissue; effect of dietary 1,3-butanediol on, 202.
— — synthesis in the rat; effect of mannoheptulose on, 473.
Feeding and exercise regimens, various; effects on rat growth and survival, 273.
—, oral and parenteral; comparative effects of on pancreatic enzymes in the rat, 1432.
Feed intake in rats; effect of sex hormones on, 968.
Feria-Velasco, A. See Bernal, A., 1157.
Feron, V. J. See van Beek, L., 1630.
Fiber, nonnutritive, binding of bile salts in vitro by, 458.
Filer, L. J., Jr. See Anderson, T. A., 619.
Fiser, R. H., Jr., J. C. Denniston, R. B. Rindsig and W. R. Beisel. Triglyceride secretion rates: use of Triton WR 1339 in the rhesus monkey, 223.
Fisher, H. See Kenney, J., 1135.
Fish meal component of catfish diet; growth factors in, 1091.
Fleischman, A. I., P. H. Lenz and M. L. Bierenbaum. Effect of lithium upon lipid metabolism in rats, 1242.
Florentino, R. F., and H. P. Broquist. Production and nutritional evaluation of a high lysine baker's yeast (*Saccharomyces cerevisiae*) in rats, 884.
Fluoride, dietary; intake in man, 1313.
— and fat; influence on gastric emptying of rats, 909.
Folate-deficient rats; malabsorption of thiamin in, 1024.
Folic acid, tritiated; uptake of in the rat studied by in vivo perfusion, 1674.
Foltz, F. M. See Maddux, G. W., 478.
Fomon, S. J. See Anderson, T. A., 619.
Food restriction and exercise; effects on deposition and mobilization of energy stores in rat, 218.
Foshee, D. P. See Driskell, J. A., 810.
Fossum, K., and J. R. Whitaker. Simple method for detecting amylase inhibitors in biological materials, 930.
Fradkin, R. See O'Toole, B. A., 1513.
Frequency of feeding low protein diets; effect on lipid metabolism in adult rats recovering from malnutrition, 118.
Frier, H. I. See Bartlett, B. S., 1637.
Frobish, L. T. See Menge, H., 1554.
Froozani, M. See Guthrie, H. A., 1273.
Fructose; effect of dietary fats and fatty acids on liver lipid accumulation induced by feeding a protein-repletion diet containing fructose to protein-depleted rats, 741.
Fry, B. E., Jr. See Richardson, M. E., 323.
Fukuyama, T. See Nakagawa, I., 1576.

G

Galactose, dietary; effect on lysosomal enzymes in the chick, 943.
— and ethanol feeding; effect on rat growth, 294.
Gallagher, A. See Hegsted, D. M., 588.
Garrod, J. See Taylor, A. W., 218.
Gastric emptying of rats; influence of fat and fluoride on, 909.
Genetic effects on response to dietary manganese deficiency in mice, 133.
Gentry, R. P. See Stake, P. E., 1279.
Geometry of nutrition, 1535.
Gerbil, inositol requirement of, 588.
Germfree rats; effect of lactose on Δ^5-steroid-reducing activity of intestinal bacteria in, 605.
Gerson, T. A comparison of the effects of dietary protein and lipid deprivation on lipid composition of liver membranes in rats, 701.
Ghoshal, A. K. See Monserrat, A. J., 1496.
Gipp, W. F., W. G. Pond, F. A. Kallfelz, J. B. Tasker, D. R. Van Campen, L. Krook and W. J. Visek. Effect of dietary copper, iron and ascorbic acid levels on hematology, blood and tissue copper, iron and zinc concentrations and ^{64}Cu and ^{59}Fe metabolism in young pigs, 532.
Girard-Globa, A. See Pamart, B., 1149.
Glucosaminoglycan and vitamin A metabolism in rats, 871.
Glucose absorption, intestinal, in growth-retarded suckling rat pups, 671.
— and fatty acids in blood of neonatal swine; effect of prolonged fasting on, 210.
— kinetic parameters in calves under standardized conditions, 1049.
Glucose-6-phosphate dehydrogenase, induction of in rats by a 90% carbohydrate diet and 8-azaguanine insensitive induction of G6PD following a transfer from 90% carbohydrate to 90% protein diet, 12.
— — and malic enzyme in liver of fasted rats; effect of carbohydrate load by intravenous infusion on, 65.
Glucose tolerance in the rat; effect of meal frequency and diet composition on, 1503.
Glutamate decarboxylase activities and vitamin B-6 requirement; relationship between in brains of male rats, 1657.
Glutathione peroxidase in the chick; effect of dietary selenium on, 747.
— — in rat liver; effect of dietary selenium on erythrocyte and on, 580.
— —; response of to dietary selenium in rats, 444.
— — system of gastrointestinal tract and other tissues in the rat; effect of dietary selenium and autoxidized lipids on, 1069.
Gluten and casein diets; differential effects on rat liver HMP shunt dehydrogenases, 819.
Glycine, arginine and lysine interaction in the nutrition of the chick, 1127.
— and serine; effect of in synthetic amino acid diets upon glycine and serine metabolism in chicks, 1018.
Glycogen content of brain and vital organs of rhesus monkey; effect of starvation on, 1189.
Gonnerman, W. A. See Ramp, W. K., 803.
Gossypol; effect of phenobarbital on the level of in the liver and the effect of gossypol and phenobarbital on liver microsomal *O*-demethylation and lipid peroxidation activities in the rat, 1567.
—, free dietary; effect on blood components and tissue iron in swine and rats, 415.

^{14}C-Gossypol urinary and biliary excretion of in swine, 754.
Goswami, T., M.-L. Vu and U. Srivastava. Quantitative changes in DNA, RNA, and protein content of the various organs of the young of undernourished female rats, 1257.
———. See Srivastava, U., 512.
Grande, F., and W. F. Prigge. Serum lipid changes produced in dogs by substituting coconut oil for either sucrose or protein in the diet, 613.
Grauel, L. See Zamenhof, S., 1002.
Grebing, S. E. See Doyle, J. J., 160.
Green, G. M. See Lyman, R. L., 105.
Greger, J. L., and R. Schwartz. Cellular changes in the exocrine pancreas of rats fed two levels of magnesium and protein, 1610.
——— and ———. Subcellular changes in protein metabolism and magnesium content of the pancreas in rats fed two levels of dietary protein and magnesium, 1618.
Growth and behavioral performance in the rat; importance of the period of dietary restriction of the dam on, 37.
—, cadmium absorption and tissue levels in growing lambs; effect of dietary cadmium on, 160.
— factors in the fish meal component of catfish diet, 1091.
— inhibitors from soybeans; isolation and characterization of in mice, 1304.
— and intermediary metabolism in rats; effect of arginine deficiency on, 1681.
—, longevity and incidence of lesions in the rat as affected by protein nutrition, 1576.
— retardation, intrauterine; effect on the biochemical maturation of brain synaptosomes in the rat, 1157.
— -retarded suckling rat pups; intestinal absorption of glucose in, 671.
Gubler, C. J., J. W. Peterson, K. K. Turpin, L. W. Crane, L. G. W. Turner and M. Bennion. Effects of thiamin deficiency and thiamin antagonists on serum and liver cholesterol levels and on cholesterol biosynthesis in rats, 1690.
Guenter, W., and J. L. Sell. A method for determining "true" availability of magnesium from foodstuffs using chickens, 1446.
Guide for authors, 138.
Guinea pig; antiscorbutic activity of ascorbate 2-sulfate in, 952.
— —; catabolism and tissue levels of ascorbic acid following long-term massive doses in, 1041.
Guthrie, H. A., M. Froozani, A. R. Sherman and G. P. Barron. Hyperlipidemia in offspring of iron-deficient rats, 1273.

H

Hafeman, D. G., R. A. Sunde and W. G. Hoekstra. Effect of dietary selenium on erythrocyte and liver glutathione peroxidase in the rat, 580.
Hall, G. A. B. See Papas, A., 653.
Hall, R. C., Jr. See Bartlett, R. S., 1637.
Hall, S. M. See Zamenhof, S., 1002.
Halsted, C. H., K. Bhanthumnavin and E. Mezey. Jejunal uptake of tritiated folic acid in the rat studied by in vivo perfusion, 1674.
Halsted, J. A., J. C. Smith, Jr., and M. I. Irwin. Monograph: a conspectus of research on zinc requirements of man, 345.
Hammick, J. W. See Reinhold, J. G., 976.
Hamster, rat and chick; vitamin E activity of γ-tocopherol in, 850.
Hanford, H. See Hegsted, D. M., 588.
Hanson, H. M. See Hsueh, A. M., 37.
Harms, R. H. See Roland, D. A., Sr., 1079.
Harper, A. E. Editorial: "Nonessential" amino acids, 965.
———. See Aguilar, T. S., 761.
———. See Ip, C. C. Y., 252.
———. See Lichtenstein, M. J., 1356.
———. See Pant, K. C., 1584.
Harper, R. B. See Schryver, H. F., 126.
Hartman, S. B. See Monserrat, A. J., 1496.
Hatfield, E. E. See Papas, A., 653, 1543.
Heart; protein metabolism in of rats force-fed a threonine-devoid diet, 463.
— of weanling rat, lipid content of; effect of consumption of glycerides containing behenic acid on, 483.
Hegsted, D. M., A. Gallagher and H. Hanford. Inositol requirement of the gerbil, 588.
———, and B. O. Juliano. Difficulties in assessing the nutritional quality of rice protein, 772.
———. See Nettleton, J. A., 916.
Hen, reproductive efficiency of as affected by cellulose and cholesterol on blood and yolk lipids, 1554.
Henkin, R. I. See McConnell, S. D., 1108.
Hepatectomy, partial, in rat, and protein malnutrition: effect on liver regeneration and synthesis of DNA, RNA and polyamines, 47.
Herbert, J. D. See Coulson, R. A., 1396.
Herman, D. L. See Skutches, C. L., 415.
Herzog, J. See Lavau, M., 1432.
Hexose monophosphate shunt dehydrogenases in rat liver; differential effects of gluten and casein diets on, 819.
— — — — of rat liver; repression of by wheat gluten, 957.
High protein diet; effect on calcium balance of young men given 500 mg calcium daily, 695.
Hill, C. H. Influence of high levels of minerals on the susceptibility of chicks to *Salmonella gallinarum*, 1221.
———. Reversal of selenium toxicity in chicks by mercury, copper, and cadmium, 593.
Hintz, H. F. See Argenzio, R. A., 18.
———. See Schryver, H. F., 126.
Hintz, R. L. See Schryver, H. F., 126.
Hoekstra, W. G. See Hafeman, D. G., 580.
Hopkins, H. A. See Yager, J. D., Jr., 273.
Hormones; influence of on vitamin K deficiency and epoxidation of vitamin K in the rat, 660.
Horn, L. R., M. O. Barker, G. Reed and M. Brin. Studies on peroxidative hemolysis and erythrocyte fatty acids in the rabbit: effect of dietary PUFA and vitamin E, 192.
Horse; calcium and phosphorus homeostasis in, 18.
—, young, mineral composition of the whole body, liver and bone of, 126.
House, W. A. See Van Campen, D., 84.
———. See Welch, R. M., 733.
Howard, L., C. Wagner and S. Schenker. Malabsorption of thiamin in folate-deficient rats, 1024.

HSUEH, A. M., M. SIMONSON, B. F. CHOW AND H. M. HANSON. The importance of the period of dietary restriction of the dam on behavior and growth in the rat, 37.
Human, adult, fed varying quantities of tryptophan; nitrogen retention of, 1121.
— threonine requirement determined from the plasma threonine response curve, 495.
—, tryptophan and methionine metabolism of adult females as affected by vitamin B-6 deficiency, 1348.
HURLEY, L. S., AND L. T. BELL. Genetic influence on response to dietary manganese deficiency in mice, 133.
———. See Mutch, P. B., 828.
HURLEY, W. L. See Bull, L. S., 968.
HURWITZ, S. See Sklan, D., 1086.
Hydrocortisone in vitamin B-6-deficient rats; induction of tyrosine transaminase activity by, 1407.
Hyperalimentation by intravenous diffusion of carbohydrate load; effect on liver G6PD and malic enzyme of fasted rats, 65.
Hyperlipidemia in offspring of iron-deficient rats, 1273.
Hypocholesteremic activity of konjac mannan by inhibition of bile acid absorption in the rat ileum, 69.

I

IACONO, J. M. Effect of varying the dietary level of calcium on plasma and tissue lipids of rabbits, 1165.
IMONDI, A. R., AND R. P. STRADLEY. Utilization of enzymatically hydrolyzed soybean protein and crystalline amino acid diets by rats with exocrine pancreatic insufficiency, 793.
Infection by *Salmonella gallinarum*; influence of high levels of minerals on the susceptibility of chicks to, 1221.
Inositol requirement of the gerbil, 588.
Insulin and glucose in serum, and milk fat percentage in lactating cows; effects of high grain feeding and stage of lactation on, 379.
— levels, plasma amino acids, and response of nitrogen metabolism to various levels of methionine infusion in sheep, 1646.
Intestine, small, of rat; effects of ethanol on transport of manganese by, 101.
IP, C. C. Y., AND A. E. HARPER. Liver polysome profiles and protein synthesis in rats fed a threonine-imbalanced diet, 252.
IRITANI, N., AND J. NOGI. Influence of linoleate on cholesterol turnover in rats, 546.
Iron absorption by humans from veal liver, 983.
—, copper and ascorbic acid; effects on iron utilization in young pigs, 532.
—, copper, and pantothenic acid nutrition and tissue cytochrome oxidase activity in the growing rat, 1285.
— -deficient rats; hyperlipidemia in offspring of, 1273.
—, dietary; bioavailability of different sources of, fed to Pitman-Moore miniature pigs, 619.
— extrinsic label; validation of in monitoring absorption of nonheme food iron in normal and iron-deficient rats, 1490.
— in tissue of swine and rats; effect of dietary free gossypol on blood components and on, 415.
—, zinc and copper concentrations in rat tissues; effect of a low protein diet on retention of ^{65}Zn and on, 84.
IRWIN, M. I. See Halsted, J. A., 345.
ISMAIL-BEIGI, F. See Reinhold, J. G., 976.
ITOH, H., T. KISHI AND I. CHIBATA. Plasma amino acids and stomach contents of rats fed casein and the corresponding amino acid mixture, 386.

J

JACOBSON, N. L., M. RICHARD, P. J. BERGER AND J. P. KLUGE. Comparative effects of tallow, lard and soybean oil, with and without supplemental cholesterol, on growth, tissue cholesterol and other responses of calves, 573.
JASINSKI, R. See Prohaska, J. R., 1525.
JASPER, H. G., AND J. A. BRASEL. Rat liver DNA synthesis during the "catch-up" growth of nutritional rehabilitation, 405.
JENNY, B. F., C. E. POLAN AND F. W. THYE. Effects of high grain feeding and stage of lactation on serum insulin, glucose and milk fat percentage in lactating cows, 379.
JENSEN, L. S. See Kushwaha, R. P. S., 901.
JENSEN, R. L. See Anderson, T. A., 619.
JOHNS, J. T., AND W. G. BERGEN. Effect of essential fatty acid deficiency on amino acid uptake by the small intestine of rats, 300.
JOHNSON, B. C. See Mack, D. O., 12.
Joule and calorie (Letters to the Editor), 1097.
JUKES, T. H. Dilworth Wayne Woolley—a biographical sketch, 507.
JULIANO, B. O. See Hegsted, D. M., 772.

K

KADIRVEL, R., AND F. H. KRATZER. Uptake of L-arginine and L-lysine by the small intestine and its influence on arginine–lysine antagonism in chicks, 339.
———, P. VOHRA AND ———. Arginine, lysine and glycine interaction in the in the chick, 1127.
KAJIMOTO, M. See Nakagawa, I., 1576.
KALLFELZ, F. A. See Cipp, W. F., 532.
KAMM, J. J. See Kuenzig, W., 952.
KAPPEL, L. C. See Tao, R. C., 1646.
KARIMIAN, N. See Reinhold, J. G., 976.
KEIDING, N. See Keiding, S., 294.
KEIDING, S., N. KEIDING AND N. TYGSTRUP. Effect of galactose–ethanol feeding on growth in rats, 294.
KEMMERER, A. R. See Eckhert, C. D., 865.
———. See Peng, Y., 1008.
KENNETT, W. S. See Bull, L. S., 968.
KENNEY, J., AND H. FISHER. Differential utilization of low and high dietary cholesterol by cockerels fed medium-chain triglycerides or corn oil, 1135.
α-Keto analogues substituted for five essential amino acids in the diet of rats, 1208.
KETOLA, H. G., AND M. C. NESHEIM. Influence of dietary protein and methionine levels on the requirement for choline by chickens, 1484.
KIM, Y.-C. L., AND G. WOLF. Vitamin A deficiency and the glycoproteins of rat corneal epithelium, 710.

KIRIYAMA, S., A. ENISHI AND K. YURA. Inhibitory effect of konjac mannan on bile acid transport in the everted sacs from rat ileum, 69.
KIRKSEY, A. See Pang, R. L., 111.
KISHI, T. See Itoh, H., 386.
KLAIN, G. J., AND A. W. MEIKLE. Mannoheptulose and fatty acid synthesis in the rat, 473.
KLEIBER, M. Letters to the editor: Calorie and joule, 1097.
KLEVAY, L. M. See Murthy, L., 1458.
KLUGE, J. P. See Jacobson, N. L., 573.
KOH, E., AND C. D. BERDANIER. Effects of mannoheptulose on lipid metabolism of rats, 1227.
Konjac mannan; inhibitory effect on bile acid transport in the everted sacs from rat ileum, 69.
KOPPLE, J. D. See Chan, W., 678.
KORYCKA-DAHL, M. See Chen, T. C., 1056.
KRAMER, L. See Osis, D., 1313.
KRATZER, F. H. See Kadirvel, R., 339, 1127.
KRAUSE, R. F., AND K. C. BEAMER. Lipid content and phospholipid metabolism of subcellular fractions from testes of control and retinol-deficient rats, 629.
KRITCHEVSKY, D., AND J. A. STORY. Binding of bile salts in vitro by nonnutritive fiber, 458.
———. See Story, J. A., 1185.
KROOK, L. See Gipp, W. F., 532.
KUENZIG, W., R. AVENIA AND J. J. KAMM. Studies on the antiscorbutic activity of ascorbate 2-sulfate in the guinea pig, 952.
KURUP, P. A. See Sudhakaran, P. R., 871, 1466.
———. See Vijayakumar, S. T., 423.
KUSHWAHA, R. P. S., AND L. S. JENSEN. In vivo and in vitro utilization of labeled precursors for choline synthesis in mature Japanese quail as compared to rats, 901.
Kynurenine, enzymatic conversion of L- and D-tryptophan to by rat liver, 227.

L

Lactation, zinc deficiency during; effect on postnatal growth and development of rats, 828.
LAMB, A. J., P. APIWATANAPORN AND J. A. OLSON. Induction of rapid, synchronous vitamin A deficiency in the rat, 1140.
Lamb(s), growing; effect of dietary cadmium on growth, cadmium absorption and tissue levels in, 160.
—, growing, responses of to abomasal infusion of corn oil, starch, casein, and amino acid mixtures, 1543.
—; response of to oral or abomasal supplementation of methionine or methionine hydroxy analog, 653.
LAVAU, M., R. BAZIN AND J. HERZOG. Comparative effects of oral and parenteral feeding on pancreatic enzymes in the rat, 1432.
LAWLER, J. R. See Schroeder, H. R., 943.
LAYRISSE, M. See Martínez-Torres, C., 983.
LEACH, R. M., JR. Studies on the potassium requirement of the laying hen, 684.
LEETS, I. See Martínez-Torres, C., 983.
LENZ, P. H. See Fleischman, A. I., 1242.
Lesions; growth and longevity in the rat as affected by protein nutrition, 1576.
Letters to the Editor: Calorie and Joule, 1097; thiamin deficiency, 272.
LEVEILLE, G. A. See Romsos, D. R., 202, 1438, 1503.
———. See Tsai, A. C., 782.
LICHTENSTEIN, M. J., V. R. POTTER AND A. E. HARPER. Organ weights and tyrosine aminotransferase levels in the rat during adaptation to periodic fasting, 1356.
———. See Yager, J. D., Jr., 273.
LIFSHITZ, F. See Wapnir, R. A., 843.
LINKSWILER, H. M. See Anand, C. R., 695.
———. See Shin, H. K., 1348.
Linoleate; influence of on cholesterol turnover in rats, 546.
Lipid(s), blood and yolk and reproductive efficiency of the hen as affected by cellulose and cholesterol, 1554.
— content of heart of weanling rat; effect of consumption of glycerides containing behenic acid on, 483.
— content and phospholipid metabolism of subcellular fractions from testes of control and retinol-deficient rats, 629.
— in dog serum; changes produced by substituting coconut oil for either sucrose or protein in the diet, 613.
— metabolism in rats; effect of lithium upon, 1242.
— metabolism in rats; effects of mannoheptulose on, 1227.
— peroxidation and metal content in some rat tissues; effect of dietary zinc on, 434.
— in plasma and tissue of rabbits; effect of varying the dietary level of calcium on, 1165.
— and protein deprivation in rats; effects of on lipid composition of liver membranes, 701.
—, sequential renal; changes in weanling rats fed a choline-deficient diet, 1496.
— in serum of young Show Racer and White Carneau pigeons fed a semipurified diet with or without cholesterol, 719.
Lipogenesis in adult rats recovering from malnutrition; effect of frequency of feeding on, 118.
—, in vitro and adipose tissue of bovine; fatty acid composition of, 430.
Lithium; effect of upon lipid metabolism in rats, 1242.
LITTLEFIELD, L. H. See Menge, H., 1554.
Liver; effect of phenobarbital on the level of gossypol in and the effect of gossypol and phenobarbital on liver microsomal *O*-demethylation and lipid peroxidation activities in the rat, 1567.
— lipid accumulation induced by feeding a protein-repletion diet containing fructose to protein-depleted rats; effect of dietary fats and fatty acids on, 741.
— pyrrolase in rat; role in conversion of L- and D-tryptophan to kynurenine, 227.
— of rat; vitamin A and lysosomal stability in, 1466.
— regeneration in rat after partial hepactectomy under conditions of protein deficiency, 47.
—, veal; iron absorption by humans from, 983.
LIVREA, G., G. CARROZZA, L. MANASSERI AND U. MURACA. On the repression of rat liver HMP shunt dehydrogenases by wheat gluten, 957.
———. See Carozza, G., 819.
Longevity, growth and incidence of lesions in the rat as affected by protein nutrition, 1576.
LOOI, S. H., AND R. RENNER. Effect of feeding

"carbohydrate-free" diets on the chick's requirement for methionine, 400.
———, AND ———. Effect of feeding "carbohydrate-free" diets on the chick's requirement for vitamin B-12, 394.
LOWE, J. E. See Argenzio, R. A., 18.
———. See Schryver, H. F., 126.
LOWTHER, D. A., H. C. ROBINSON, J. W. DOLMAN AND K. W. THOMAS. Cartilage matrix components in chickens with tibial dyschondroplasia, 922.
LUECKE, R. W. See Prohaska, J. R., 1525.
LUPIEN, P. J. See Audet, A., 91.
LUTHER, L. W. See Coon, C. N., 1018.
LYMAN, R. L., B. A. OLDS AND G. M. GREEN. Chymotrypsinogen in the intestine of rats fed soybean trypsin inhibitor and its inability to suppress pancreatic enzyme secretions, 105.
LYNCH, A. See Younoszai, M. K., 671.
Lysine, arginine and glycine interaction in the nutrition of the chick, 1127.
— and arginine; intestinal uptake of by the chick, 339.
—; production and nutritional evaluation of a baker's yeast high in, 884.
Lysosomal stability and vitamin A in rat liver, 1466.

M

MACK, D. O., J. J. WATSON, A. M. CHANDLER AND B. C. JOHNSON. Induction in rats of glucose-6-phosphate dehydrogenase by a 90% carbohydrate diet and 8-azaguanine insensitive induction of glucose-6-phosphate dehydrogenase following a transfer from the 90% carbohydrate diet to a 90% protein diet, 12.
MADDUX, G. W., F. M. FOLTZ AND S. R. NELSON. Effect of vitamin A intoxication on intracranial pressure and brain water in rats, 478.
Magnesium content and protein metabolism of the pancreas in rats fed two levels of dietary protein and magnesium; subcellular changes in, 1618.
— deficiency in rats; cellular changes in the exocrine pancreas as affected by, 1610.
— from foodstuffs; a method for determining "true" availability of in chickens, 1446.
Malic enzyme activity and fatty acid synthesis in rat liver and adipose tissue; effect of dietary 1,3-butanediol on, 202.
— — and glucose-6-phosphate dehydrogenase in liver of fasted rats; effect of carbohydrate load by intravenous infusion on, 65.
Malnutrition, adult rats recovering from; effect of frequency of feeding on lipogenesis in, 118.
—, maternal, and cell development of rat progeny, 512.
—, postnatal; rat liver DNA synthesis during the "catch-up" growth of nutritional rehabilitation, 405.
— of rats; effect on amino acid absorption, 843.
MALZER, J. L. See Clark, H. E., 1121.
Man; a conspectus of research on zinc requirements of, 345.
—; dietary fluoride intake in, 1313.
—; iron absorption by from veal liver, 983.
—, young, given 500 mg calcium daily; effect of protein intake on calcium balance, 695.
MANASSERI, L. See Carrozza, G., 819.
———. See Livrea, G., 957.
Manganese, dietary deficiency; genetic influence on response to in mice, 133.
—, transport of by small intestine of rat; effect of ethanol on, 101.
MANN, G. V. See O'Toole, B. A., 1513.
Mannoheptulose; effects of on lipid metabolism in rats, 1227.
— and fatty acid synthesis in the rat, 473.
MARSH, A. C. See Sweeney, J. P., 1115.
MARTINEZ-DE JESUS, J. See Rivera, A., Jr., 1189.
MARTÍNEZ-TORRES, C., I. LEETS, M. RENZI AND M. LAYRISSE. Iron absorption by humans from veal liver, 983.
MATRONE, G. See Potter, S., 638.
MATSCHINER, J. T., AND A. K. WILLINGHAM. Influence of sex hormones on vitamin K deficiency and epoxidation of vitamin K in the rat, 660.
MATTERSON, L. D., AND W. J. PUDELKIEWICZ. Relative potency of several forms of α-tocopherols in the chick liver storage bioassay, 79.
MATTSON, F. H., AND J. A. STRECK. Effect of the consumption of glycerides containing behenic acid on the lipid contents of the heart of weanling rats, 483.
Maynard, Leonard Amby; biography of, 1.
MCCARTNEY, T. H. See Poston, H. A., 315.
MCCONNELL, S. D., AND R. I. HENKIN. Altered preference for sodium chloride, anorexia, and changes in plasma and urinary zinc in rats fed a zinc-deficient diet, 1108.
MCGOWN, E. L., AND J. W. SUTTIE. Influence of fat and fluoride on gastric emptying of rats, 909.
MCNULTY, M. See Taylor, A. W., 218.
Meal frequency and diet composition; effect on glucose tolerance in the rat, 1503.
MEIKLE, A. W. See Klain, G. J., 473.
MELIZA, L. L. See Peng, Y., 1008.
MENGE, H., L. H. LITTLEFIELD, L. T. FROBISH AND B. T. WEINLAND. Effect of cellulose and cholesterol on blood and yolk lipids and reproductive efficiency of the hen, 1554.
Menhaden oil, oxidized, and dietary α-tocopherol and ethoxyquin interactions in channel catfish (*Ictalurus punctatus*), 1416.
Mercury, copper and cadmium; reversal of selenium toxicity in chicks by, 593.
— (methyl) and mercuric chloride, toxicity of in the rat; effect of selenite on, 638.
MERTZ, W. See Roginski, E. E., 599.
Messenger RNA of the livers of rats force-fed a threonine-devoid or complete diet, 726.
Metabolic characteristics of the carbohydrate-sensitive BHE strain of rats, 1246.
Metal content in some rat tissues; effect of dietary zinc on, 434.
Methionine, dietary level; effect on its metabolism in rats, 761.
—; effect of feeding carbohydrate-free diets on the chick's requirement for, 400.
— hydroxy analog or methionine, oral or abomasal supplementation of; response of lambs to, 653.
— infusion in sheep; response of nitrogen metabolism, plasma amino acids and insulin levels to various levels of, 1646.
— or methionine hydroxy analog, oral or abomasal supplementation of; response of lambs to, 653.

— and protein dietary levels; influence on the requirement for choline by chickens, 1484.
— for rats; utilization of heated soybean protein isolate as a dietary source of, 1389.
— and tryptophan metabolism of adult females as affected by vitamin B-6 deficiency, 1348.
— and vitamin A; effect on growth and amino acid composition of body protein in rainbow trout fingerlings, 865.
MEZEY, E. See Halsted, C. H., 1674.
Mice; genetic influence on response to dietary manganese deficiency in, 133.
—; isolation and characterization of growth inhibitors from soybeans in, 1304.
MICHAELIS, O. E., IV, AND B. SZEPESI. The mechanism of a specific metabolic effect of sucrose in the rat, 1597.
Microflora introduced in intestine of germfree rat; effect of lactose on Δ^5-steroid-reducing activity of, 605.
Milk fat percentage in lactating cows; effects of high grain feeding and stage of lactation in serum insulin, glucose, and, 379.
— yield, nitrogen utilization and amino acid nutrition of the dairy cow; effect of abomasal infusion of sodium caseinate on, 151.
MILLER, W. J. See Stake, P. E., 1279.
MILNER, J. A., A. E. WAKELING AND W. J. VISEK. Effect of arginine deficiency on growth and intermediary metabolism in rats, 1681.
Mineral(s) composition of the whole body; and liver and bone of young horses, 126.
—, high levels of; effect on the susceptibility of chicks to *Salmonella gallinarum*, 1221.
— mixtures; development and reversibility of urolithiasis in rats by, 599.
MITCHENER, M. See Schroeder, H. A., 239.
MOLITORIS, B. A. See Baker, D. H., 553.
Monkey, rhesus; starvation and the glycogen of brain and vital organs of, 1189.
—, rhesus; Triton effects on plasma lipids on, 223.
MONSEN, E. R. Validation of an extrinsic iron label in monitoring absorption of nonheme food iron in normal and iron-deficient rats, 1490.
MONSERRAT, A. J., E. A. PORTA, A. K. GHOSHAL AND S. B. HARTMAN. Sequential renal lipid changes in weanling rats fed a choline-deficient diet, 1496.
MOON, P., AND D. E. SPENCER. A geometry of nutrition, 1535.
MOON, W. H. See Clark, H. E., 1121.
MORALES, M. See Bernal, A., 1157.
MORERO, R. D. See Bloj, B., 1265.
Morgan, Agnes Fay; biography of, 1101.
MOSER, P. B., AND C. D. BERDANIER. Effect of early sucrose feeding on the metabolic patterns of mature rats, 687.
MULLER, L. D. See Schingoethe, D. J., 558.
MURACA, U. See Carrozza, G., 819.
———. See Livrea, G., 957.
MURAI, T., AND J. W. ANDREWS. Interactions of dietary α-tocopherol, oxidized menhaden oil and ethoxyquin on channel catfish (*Ictalurus punctatus*), 1416.
MURTHY, L., L. M. KLEVAY AND H. G. PETERING. Interrelationships of zinc and copper nutriture in the rat, 1458.
MURTY, C. N. See Sidransky, H., 726.
Muscle and brain electrolytes in rats; changes in as affected by natural imbalanced diets, 1381.
MUSTEN, B., D. PEACE AND G. H. ANDERSON. Food intake regulation in the weanling rat: self-selection of protein and energy, 563.
MUTCH, P. B., AND L. S. HURLEY. Effect of zinc deficiency during lactation on postnatal growth and development of rats, 828.

N

NABER, E. C., AND J. F. ELLIOT. Effect of certain cobalamin acids and their derivatives on embryonic development and growth in the chick, 28.
NAIR, P. P. See Stein, M. S., 187.
NAKAGAWA, I., A. SASAKI, M. KAJIMOTO, T. FUKUYAMA, T. SUZUKI AND E. YAMADA. Effect of protein nutrition on growth, longevity and incidence of lesions in the rat, 1576.
NAKANO, K., T. ANDO AND K. ASHIDA. Effect of feeding carbohydrate or fat on incorporation of ^{14}C-phenylalanine in vivo and in vitro into rat liver and muscle protein, 264.
NASON, A. P. See Schroeder, H. A., 167, 239.
NEAL, R. A. See Dalvi, R. R., 1476.
NEATHERY, M. W. See Stake, P. E., 1279.
NELSON, S. E. See Anderson, T. A., 619.
NELSON, S. R. See Maddux, G. W., 478.
NESHEIM, M. C. See Ketola, H. G., 1484.
NETTLETON, J. A., AND D. M. HEGSTED. Reutilization of guanido-labeled arginine in rat liver proteins and the influence of diet, 916.
Nickel and cadmium; interactions with zinc, chromium, copper and manganese in rat tissues, 167.
—, dietary; life-term effects in rats: survival, tumors, interactions with trace elements and tissue levels, 239.
Nitrogen metabolism of rats and food intake; changes in while adapting to a low or high protein diet, 1008.
— —, response of; and plasma amino acids and insulin levels to various levels of methionine infusion in sheep, 1646.
— retention of adult human subjects fed varying quantities of tryptophan, 1121.
— from selected purines and pyrimidines and from urea; utilization of by the young chick, 553.
NIXT, T. L. See Anderson, T. A., 619.
NOGI, J. See Iritani, N., 546.
Nomenclature policy: generic descriptors and trivial names for vitamins and related compounds, 144.
Nutrition, a geometry of, 1535.
Nutritional quality of oilseed protein isolates as determined with larvae of the yellow mealworm, *Tenebrio molitor* L., 1172.

O

Obesity; effects of total fasting with and without exercise on body composition of the rat, 452.
Oilseed protein isolates; nutritional quality of as determined with larvae of the yellow mealworm, *Tenebrio molitor* L., 1172.
OKADA, M., AND K. SUZUKI. Amino acid metabolism in rats fed a high protein diet without pyridoxine, 287.

OKEY, R. Agnes Fay Morgan, a biographical sketch, 1101.
OLDS, B. A. See Lyman, R. L., 105.
OLSON, J. A. See Lamb, A. J., 1140.
OLSON, O. E. See Palmer, I. S., 306.
OMAYE, S. T., AND A. L. TAPPEL. Effect of dietary selenium on glutathione peroxidase in the chick, 747.
OMSTEDT, P. T., AND A. VON DER DECKEN. Functional instability of skeletal muscle ribosomes after protein restriction of rats, 1061.
Oral and parenteral feeding; comparative effects of on pancreatic enzymes in the rat, 1432.
Organ weights and tyrosine aminotransferase levels in the rat during adaptation to periodic fasting, 1356.
OSCAI, L. B. See Babirak, S. P., 452.
OSIS, D., L. KRAMER, E. WIATROWSKI AND H. SPENCER. Dietary fluoride intake in man, 1313.
O'TOOLE, B. A., R. FRADKIN, J. WARKANY, J. G. WILSON AND G. V. MANN. Vitamin A deficiency and reproduction in rhesus monkeys, 1513.
OWENS, F. N. See Papas, A., 653, 1543.

P

PAGE, J. W. See Andrews, J. W., 1091.
PALMER, I. S., AND O. E. OLSON. Relative toxicities of selenite and selenate in the drinking water of rats, 306.
PAMART, B., A. GIRARD-GLOBA AND G. BOURDEL. Induction of tyrosine aminotransferase and depression of protein synthesis in rat liver by a tryptophan-free mixture of amino acids, 1149.
Pancreas; cellular changes of in rats fed two levels of magnesium and protein, 1610.
—, enzyme secretions of; chymotrypsinogen in the intestine of rats fed soybean trypsin inhibitor and its inability to suppress, 105.
—, role of in endogenous zinc excretion in the bovine, 1279.
—; subcellular changes in protein metabolism and magnesium content of in rats fed two levels of dietary protein and magnesium, 1618.
Pancreatic insufficiency, exocrine, in rats; utilization of enzymatically hydrolized soybean protein and crystalline amino acid diets, 793.
PANG, R. L., AND A. KIRKSEY. Early postnatal changes in brain composition in progeny of rats fed different levels of dietary pyridoxine, 111.
———. See Clark, H. E., 1121.
PANT, K. C., Q. R. ROGERS AND A. E. HARPER. Plasma and tissue free amino acid concentrations in rats fed tryptophan-imbalanced diets with or without niacin, 1584.
Pantothenic acid, and iron and copper nutrition and tissue cytochrome oxidase activity in the growing rat, 1285.
PAPAS, A., G. A. B. HALL, E. E. HATFIELD AND F. N. OWENS. Response of lambs to oral or abomasal supplementation of methionine hydroxy analog or methionine, 653.
———, E. E. HATFIELD AND F. N. OWENS. Responses of growing lambs to abomasal infusion of corn oil, starch, casein, and amino acid mixtures, 1543.
Parathyroidism, hypocalcemia and bone resorption in rats induced by dietary phosphate, 1195.
Parenteral and oral feeding; comparative effects of on pancreatic enzymes in the rat, 1432.
PARMENTIER, G. See Eyssen, H., 605.
PARSA, A. See Reinhold, J. G., 976.
PEACE, D. See Musten, B., 563.
PELUFFO, R. O., AND R. R. BRENNER. Influence of dietary protein on 6- and 9-desaturation of fatty acids in rats of different ages and in different seasons, 894.
PENG, Y., L. L. MELIZA, M. G. VAVICH AND A. R. KEMMERER. Changes in food intake and nitrogen metabolism of rats while adapting to a low or high protein diet, 1008.
PENG, Y. M. See Chvapil, M., 434.
PERKINS, E. G. See Shemer, M., 1389.
PETERING, H. G. See Murthy, L., 1458.
PETERSON, J. W. See Gubler, C. J., 1690.
PFANDER, W. H. See Doyle, J. J., 160.
PFEIFER, G. D., AND B. SZEPESI. Changes in hepatic RNA synthesis in the starve-refeed response of the rat, 1178.
Phenobarbital; effect of on the level of gossypol in the liver and the effect of gossypol and phenobarbital on liver microsomal *O*-demethylation and lipid peroxidation activities in the rat, 1567.
Phosphate transport in chick ileum in vitro: effect of cholecalciferol, calcium, sodium and metalic inhibitors, 489.
— transport in rat intestine; role of vitamin D metabolites in, 1056.
Phosphorus and calcium homeostasis in horses, 18.
—, dietary; hypocalcemia, hyperparathyroidism and bone resorption in rats induced by, 1195.
PIERCE, J. O., II. See Doyle, J. J., 160.
Pig(s), Pitman-Moore miniature; bioavailability of different sources of dietary iron fed to, 619.
—; urea excretion of as an indicator of protein quality and amino acid requirements, 542.
—, young; effect of dietary copper, iron and ascorbic acid on iron utilization, 532.
Pigeons, young Show Racer and White Carneau fed a semipurified diet with or without cholesterol; serum lipids of, 719.
Plasma amino acids, insulin levels and response of nitrogen metabolism to various levels of methionine infusion in sheep, 1646.
— and tissue free amino acid concentrations in rats fed tryptophan-imbalanced diets with or without niacin, 1584.
POLAN, C. E. See Jenny, B. F., 379.
Polysome profiles in liver and protein synthesis in rats fed a threonine-imbalanced diet, 252.
Polyunsaturated fatty acids, dietary, and vitamin E; effect of on peroxidative hemolysis and erythrocyte fatty acids in the rabbit, 192.
POND, W. G. See Atinmo, T., 1033.
———. See Gipp, W. F., 532.
POOLE, D. R. See Seerley, R. W., 210.
PORTA, E. A. See Monserrat, A. J., 1496.
PORTELA, M. L. See Closa, S., 1381.
POSTON, H. A., AND T. H. MCCARTNEY. Effect of dietary biotin and lipid on growth, stamina, lipid metabolism and biotin-containing enzymes in brook trout (*Salvelinus fontinalis*), 315.
Potassium requirement of the laying hen, 684.
POTHOVEN, M. A., D. C. BEITZ AND A. ZIMMERLI. Fatty acid compositions of bovine adipose tissue of in vitro lipogenesis, 430.

POTTER, S., AND G. MATRONE. Effect of selenite on the toxicity of dietary methyl mercury and mercuric chloride in the rat, 638.
POTTER, V. R. See Lichtenstein, M. J., 1356.
———. See Yager, J. D., Jr., 273.
Pregnancy in swine; effect of dietary energy vs. protein restriction on blood constituents and reproductive performance, 1033.
PRIGGE, W. F. See Grande, F., 613.
Proceedings, American Institute of Nutrition (*see* American Institute of Nutrition), 1365.
PROHASKA, J. R., R. W. LUECKE AND R. JASINSKI. Effect of zinc deficiency from day 18 of gestation and/or during lactation on the development of some brain enzymes, 1525.
Protein-calorie malnutrition in young miniature swine: brain free amino acids, 1329.
— — in young miniature swine: serum free amino acids, 1339.
Protein deficiency in rat; effect on bone marrow and liver nucleic acid and polyamine synthesis after loss of blood, 59.
— deficiency in rats; cellular changes in the exocrine pancreas as affected by, 1610.
— deficiency in rhesus monkey; metabolism of albumin and body fluid compartments in, 858.
—, DNA, and RNA content; quantitative changes of in various organs of the young of undernourished female rats, 1257.
— intake, high or low; changes in food intake and nitrogen metabolism of rats while adapting to, 1008.
— and lipid deprivation in rats; effects of on lipid composition of liver membranes, 701.
— metabolism and magnesium content of the pancreas in rats fed two levels of dietary protein and magnesium; subcellular changes in, 1618.
— and methionine dietary levels; influence on the requirement for choline by chickens, 1484.
— nutrition; effect of on growth, longevity and incidence of lesions in the rat, 1576.
— restriction of rats; functional instability of skeletal muscle ribosomes after, 1061.
— restriction vs. energy restriction; effect on blood constituents and reproductive performance in swine, 1033.
—, rice; difficulties in assessing the nutritional quality of, 772.
— -sparing action of fat and carbohydrate studied by measuring incorporation of ^{14}C-phenylalanine in vivo and in vitro into rat liver and muscle protein, 264.
— synthesis and liver polysome profiles in rats fed a threonine-imbalanced diet, 252.
— synthesis in the skeletal muscle of vitamin E-deficient rabbit, 521.
PUDELKIEWICZ, W. J. See Matterson, L. D., 79.
PUSKAR, T., AND G. P. TRYFIATES. Induction of tyrosine transaminase activity by hydrocortisone in vitamin B-6-deficient rats, 1407.
Pyridoxine deficiency; effect on amino acid metabolism in rats fed a high protein diet, 287.
— -deficient rat; triglyceride metabolism in, 91.
—; early postnatal changes in brain composition in progeny of rats fed different levels of dietary, 111.

Q

Quail, Japanese, pathological changes produced in by ingestion of cadmium, 323.
—, mature Japanese, choline biosynthesis in compared to rats, 901.

R

Rabbit(s); effect of dietary PUFA and vitamin E on peroxidative hemolysis and erythrocyte fatty acids in, 192.
—; effect of varying the dietary level of calcium on plasma and tissue lipids of, 1165.
—, vitamin E-deficient; protein synthesis in the skeletal muscle of, 521.
—; weanling, with chronic plumbism; effect of vitamin E on δ-aminolevulinic acid dehydratase activity in, 1637.
RAMALINGASWAMI, V. See Deo, M. G., 858.
RAMP, W. K., S. U. TOVERUD AND W. A. GONNERMAN. Effects of cholecalciferol on bone formation and serum calcium, phosphate and magnesium in chicks, 803.
RAND, W. M. See Tontisirin, K., 495.
Rapeseed meal; evaluation of commercial and Bronowski variety in calf rations, 558.
REDDY, K., AND A. L. TAPPEL. Effect of dietary selenium and autoxidized lipids on the glutathione peroxidase system of gastrointestinal tract and other tissues in the rat, 1069.
REED, G. See Horn, L. R., 192.
REEVES, R. D., AND L. ARNRICH. Influence of frequency of feeding low protein diets on lipid metabolism in adult rats recovering from malnutrition, 118.
REID, J. T. See Schryver, H. F., 126.
REINHOLD, J. G., A. PARSA, N. KARIMIAN, J. W. HAMMICK AND F. ISMAIL-BEIGI. Availability of zinc in leavened and unleavened wholemeal wheaten breads as measured by solubility and uptake by rat intestine in vitro, 976.
RENNER, R. See Looi, S. H., 394, 400.
RENZI, M. See Martínez-Torres, C., 983.
Reproduction in the laying hen, abnormalities in; relationship of calcium to, 1079.
— and vitamin A deficiency in rhesus monkeys, 1513.
Resection of the small bowel in rats; nutritional adaptation after, 994.
Retinol-deficient rats; lipid content and phospholipid metabolism of subcellular fractions from testes of, 629.
α-Retinol; "partial" vitamin A function of, 1662.
Rhesus monkey(s); metabolism of albumin and body fluid compartments in protein deficiency in, 858.
— —; vitamin A deficiency and reproduction in, 1513.
Ribosomes in skeletal muscle of rats; functional instability of after protein restriction, 1061.
Rice protein; difficulties in assessing the nutritional quality of, 772.
RICHARD, M. See Jacobson, N. L., 573.
RICHARDSON, M. E., M. R. SPIVEY FOX AND B. E. FRY, JR. Pathological changes produced in Japanese quail by ingestion of cadmium, 323.
RINDSIG, R. B. See Fiser, R. H., Jr., 223.
RIO, M. E. See Closa, S., 1381.

RIVERA, A., JR., AND J. MARTINEZ-DE-JESUS. Starvation and the glycogen of the brain and vital organs of the rhesus monkey, 1189.
RIVERS, J. M. See Sorensen, D. I., 1041.
RNA, DNA, and protein content; quantitative changes of in various organs of the young of undernourished female rats, 1257.
— synthesis, hepatic, in the rat; changes in after starvation–refeeding, 1178.
ROBINSON, H. C. See Lowther, D. A., 922.
RODDEN, F. A., AND C. P. BERG. Enzymatic conversion of L- and D-tryptophan to kynurenine by rat liver, 227.
ROGERS, A. E. See Sneider, W. D., 1662.
ROGERS, Q. R. See Pant, K. C., 1584.
ROGERS, R. R. See Anderson, T. A., 619.
ROGINSKI, E. E., AND W. MERTZ. Development and reversibility of urolithiasis in rats by mineral mixtures, 599.
ROLAND, D. A., SR., D. R. SLOAN, H. R. WILSON AND R. H. HARMS. Relationship of calcium to reproductive abnormalities in the laying hen (*Gallus domesticus*), 1079.
ROMSOS, D. R., P. S. BELO AND G. A. LEVEILLE. Effect of 1,3-butanediol on hepatic fatty acid synthesis and metabolite levels in the rat, 1438.
———, AND G. A. LEVEILLE. Effect of meal frequency and diet composition on glucose tolerance in the rat, 1503.
———, C. SASSE AND ———. Effect of dietary 1,3-butanediol on in vitro fatty acid synthesis and malic enzyme activity in rat liver and adipose tissue, 202.
———. See Tsai, A. C., 782.
ROSADO, A. See Bernal, A., 1157.
ROSSO, G. C. See Sneider, W. D., 1662.
Roughage, dietary; effects on cholesterol absorption, cholesterol turnover and steroid excretion in the rat, 1319.
ROUSSEAU, J. E., JR. See Bartlett, R. S., 1637.

S

SANAHUJA, J. C. See Closa, S., 1381.
SASAKI, A. See Nakagawa, I., 1576.
SASSE, C. See Romsos, D. R., 202.
SASSE, C. E., AND D. H. BAKER. Sulfur utilization by the chick with emphasis on the effect of inorganic sulfate on the cystine–methionine interrelationship, 244.
SAUBERLICH, H. E. See Dalvi, R. R., 1476.
SCHAFER, D. F., D. V. STEPHENSON, A. J. BARAK AND M. F. SORRELL. Effects of ethanol on the transport of manganese by small intestine of the rat, 101.
SCHENKER, S. See Howard, L., 1024.
SCHINGOETHE, D. J., G. L. BEARDSLEY AND L. D. MULLER. Evaluation of commercial rapeseed meal and Bronowski variety rapeseed meal in calf rations, 558.
———, L. J. TIDEMANN AND J. R. UCKERT. Studiesin mice on the isolation and characterization of growth inhibitors from soybeans, 1304.
SCHMIDT, S. P. See Young, J. W., 1049.
SCHNEIDER, D. L. See Spaeth, D. G., 179.
SCHROEDER, H. A., M. MITCHENER AND A. P. NASON. Life-term effects of nickel in rats: survival, tumors, interactions with trace elements and tissue levels, 239.
———, AND A. P. NASON. Interactions of trace metals in rat tissues. Cadmium and nickel with zinc, chromium, copper, manganese, 167.
SCHROEDER, H. R., J. R. LAWLER AND W. W. WELLS. Effect of dietary galactose on lysosomal enzymes in the chick, 943.
SCHRYVER, H. F., H. F. HINTZ, J. E. LOWE, R. L. HINTZ, R. B. HARPER AND J. T. REID. Mineral composition of the whole body, liver and bone of young horses, 126.
———. See Argenzio, R. A., 18.
SCHWARTZ, R. See Greger, J. L., 1610, 1618.
SCOTT, M. L. See Combs, G. F., Jr., 1292, 1297.
SCRIMSHAW, N. S. See Tontisirin, K., 495.
SECORD, D. C. See Taylor, A. W., 218.
SEERLEY, R. W., AND D. R. POOLE. Effect of prolonged fasting on carcass composition and blood fatty acids and glucose of neonatal swine, 210.
Selenate and selenite; relative toxicities in drinking water of rats, 306.
Selenite; effect of on the toxicity of dietary methyl mercury and mercuric chloride in the rat, 638.
— and selenate; relative toxicities in drinking water of rats, 306.
Selenium, dietary, and autoxidized lipids; effect on the glutathione peroxidase system of gastrointestinal tract and other tissues in the rat, 1069.
—, dietary; effect on erythrocyte and liver glutathione peroxidase in rat, 580.
—, dietary; effect on glutathione peroxidase in the chick, 747.
—, dietary, in rats; response of glutathione peroxidase to, 444.
— toxicity in chicks; reversal of by mercury, copper and cadmium, 593.
— and vitamin E; dietary requirements for as measured at the cellular level in the chick, 1292.
— and vitamin E function in the chick; antioxidant effects on, 1297.
Self-selection of protein and energy by the weanling rat, 563.
SELL, J. L. See Guenter, W., 1446.
Serine and glycine; effect of in synthetic amino acid diets upon glycine and serine metabolism in chicks, 1018.
Serum free amino acids of young miniature swine as affected by protein-calorie malnutrition, 1339.
Sex hormones; effect of on feed intake in rats, 968.
Sheep; response of nitrogen metabolism, plasma amino acids and insulin levels to various levels of methionine infusion in, 1646.
SHEMER, M., AND E. G. PERKINS. Utilization of heated soybean protein isolate as a dietary source of methionine for rats, 1389.
SHERMAN, A. R. See Guthrie, H. A., 1273.
SHIN, H. K., AND H. M. LINKSWILER. Tryptophan and methionine metabolism of adult females as affected by vitamin B-6 deficiency, 1348.
SIDRANSKY, H., E. VERNEY AND C. N. MURTY. Studies on mRNA of the livers of rats force-fed a threonine-devoid or complete diet, 726.
———. See Verney, E., 463.
SIE, T.-L., DRAPER, H. H. AND R. R. BELL. Hypocalcemia, hyperparathyroidism and bone resorption induced by dietary phosphate, 1195.

Siimes, M. A., and P. R. Dallman. Nucleic acid and polyamine synthesis in the rat during short-term protein deficiency: responsiveness of the bone marrow and liver to blood loss, 59.
———, and ———. Nucleic acid and polyamine synthesis in the rat during short-term protein deficiency: responsiveness of the liver to partial hepatectomy, 47.
———. See Dallman, P. R., 1234.
Simard, P., and U. Srivastava. Protein synthesis in the skeletal muscle of vitamin E-deficient rabbits, 521.
Simonson, M. See Hsueh, A. M., 37.
Sklan, D., P. Budowski and S. Hurwitz. Effect of soy sterols in intestinal absorption and secretion of cholesterol and bile acids in the chick, 1086.
Skutches, C. L., D. L. Herman and F. H. Smith. Effect of dietary free gossypol on blood components and tissue iron in swine and rats, 415.
———, and F. H. Smith. Effect of phenobarbital on the level of gossypol in the liver and the effect of gossypol and phenobarbital on liver microsomal *O*-demethylation and lipid peroxidation activities in the rat, 1567.
Sloan, D. R. See Roland, D. A., Sr., 1079.
Smith, F. H. See Skutches, C. L., 415, 1567.
Smith, J. A. See Young, J. W., 1049.
Smith, J. C., Jr. See Halsted, J. A., 345.
Smith, J. T. See Whittle, B., 666.
Sneider, W. D., G. C. Rosso, A. E. Rogers, G. Wolf, J. E. Dowling and M. J. Callahan. The "partial" vitamin A function of α-retinol, 1662.
Sorensen, D. I., M. M. Devine and J. M. Rivers. Catabolism and tissue levels of ascorbic acid following long-term massive doses in the guinea pig, 1041.
Sorrell, M. F. See Schafer, D. F., 101.
Sosulski, F. W. See Davis, G. R. F., 1172.
Soybean growth inhibitors; isolation and characterization of in mice, 1304.
— meal, raw, inhibited protein digestion in chicks fed; labeled casein as an indicator of, 648.
— protein, enzymatically hydrolyzed, and crystalline amino acid diets; utilization by rats with exocrine pancreatic insufficiency, 793.
— protein; utilization of a heated isolate of as a dietary source of methionine for rats, 1389.
— trypsin inhibitor fed to rats and the intestinal chymotrypsinogen's inability to suppress pancreatic enzyme secretions, 105.
Soyprotein, alkali treated in rats; nutritional effects of, 1630.
Soy sterols; effect on intestinal absorption and secretion of cholesterol and bile acids in the chick, 1086.
Spaeth, D. G., and D. L. Schneider. Turnover of taurine in rat tissues, 179.
Spencer, D. E. See Moon, P., 1535.
Spencer, H. See Osis, D., 1313.
Spirito, R. A. See Dallman, P. R., 1234.
Spivey Fox, M. R. See Richardson, M. E., 323.
Srivastava, U., M.-L. Vu and T. Goswami. Maternal dietary deficiency and cellular development of progeny in the rat, 512.
———. See Goswami, T., 1257.
———. See Simard, P., 521.
Stake, P. E., W. J. Miller, D. M. Blackmon, R. P. Gentry and M. W. Neathery. Role of pancreas in endogenous zinc excretion in the bovine, 1279.
Starvation and the glycogen of the brain and vital organs of the rhesus monkey, 1189.
Starvation–refeeding in the rat; changes in hepatic RNA synthesis after, 1178.
Stein, M. S., P. I. Caasi and P. P. Nair. Influence of dietary fat and di-2-ethylhexyl phthalate on tissue lipids in rats, 187.
Stephenson, D. V. See Schafer, D. F., 101.
Story, J. A., S. A. Tepper and D. Kritchevsky. Influence of synthetic conjugates of cholic acid on cholesteremia in rats, 1185.
———. See Kritchevsky, D., 458.
Stradley, R. P. See Imondi, A. R., 793.
Streck, J. A. See Mattson, F. H., 483.
Sucrose, early feeding of; effect on the metabolic patterns of mature rats, 687.
—; the mechanism of a specific metabolic effect of in the rat, 1597.
Sudhakaran, P. R., and P. A. Kurup. Vitamin A and glycosaminoglycan metabolism in rats, 871.
———, and ———. Vitamin A and lysosomal stability in rat liver, 1466.
Sulfate, inorganic; effect on the cystine–methionine interrelationship in the chick, 244.
Sulfur, dietary; effect on taurine excretion by the rat, 666.
Sunde, R. A. See Hafeman, D. G., 580.
Suttie, J. W. See McGown, E. L., 909.
Suzuki, K. See Okada, M., 287.
Suzuki, T. See Nakagawa, I., 1576.
Sweeney, J. P., and A. C. Marsh. Liver storage of vitamin A by rats fed carrots in various forms, 1115.
Swendseid, M. E. See Chan, W., 678.
Swine; effect of dietary free gossypol on blood components and tissue iron in rats and in, 415.
—, neonatal; effect of prolonged fasting on carcass composition and blood fatty acids and glucose of, 210.
—, reproductive performance and blood constituents of; effect of dietary energy vs. protein restriction on, 1033.
—, urinary and biliary excretion of ^{14}C-gossypol in, 754.
—, young miniature; brain free amino acids of as affected by protein-calorie malnutrition, 1329.
—, young miniature; serum free amino acids of as affected by protein-calorie malnutrition, 1339.
Synaptosomes in rat brain, biochemical maturation of; effect of intrauterine growth retardation on, 1157.
Szepesi, B. See Michaelis, O. E., IV, 1597.
———. See Pfeifer, G. D., 1178.

T

Tamir, M., R. Bielorai and E. Alumot. Labeled casein as an indicator of inhibited protein digestion in chicks fed raw soybean meal, 648.
Tamplin, C. B. See Bull, L. S., 968.
Tanphaichitr, V., and H. P. Broquist. Site of carnitine biosynthesis in the rat, 1669.

TAO, R. C., J. M. ASPLUND AND L. C. KAPPEL. Response of nitrogen metabolism, plasma amino acids and insulin levels to various levels of methionine infusion in sheep, 1646.
TAPPEL, A. L. See Chow, C. K., 444.
———. See Omaye, S. T., 747.
———. See Reddy, K., 1069.
TASKER, J. B. See Gipp, W. F., 532.
Taste preference, altered, anorexia, and changes in plasma and urinary zinc in rats fed a zinc-deficient diet, 1108.
Taurine excretion by the rat; effect of dietary sulfur on, 666.
— turnover in rat tissues, 179.
TAYLOR, A. N. In vitro phosphate transport in chick ileum: effect of cholecalciferol, calcium, sodium and metabolic inhibitors, 489.
TAYLOR, A. W., S. CARY, M. MCNULTY, J. GARROD AND D. C. SECORD. Effects of food restriction and exercise upon the deposition and mobilization of energy stores in the rat, 218.
Tenebrio molitor L., nutritional quality of oilseed protein isolates as determined with larvae of the yellow mealworm, 1172.
TEPPER, S. A. See Story, J. A., 1185.
Testis of retinol-deficient rats; lipid content and phospholipid metabolism of subcellular fractions from, 629.
Thiamin antagonists and thiamin deficiency on serum and liver cholesterol levels and on cholesterol biosynthesis in rats, 1690.
— deficiency and thiamin antagonists on serum and liver cholesterol levels and on cholesterol biosynthesis in rats, 1690.
— malabsorption in folate-deficient rats, 1024.
— metabolism by rat liver alcohol dehydrogenase, 1476.
THOMAS, K. W. See Lowther, D. A., 922.
Threonine-devoid or complete diet force-fed to rats; effect on hepatic mRNA metabolism, 726.
— -devoid diet force-fed to rats; alterations in cardiac protein metabolism, 463.
— -imbalanced diet; liver polysome profiles and protein synthesis in rats fed, 252.
— requirements of young men and elderly women obtained from the plasma threonine response curve, 495.
THURSTON, E. W. See Ershoff, B. H., 937.
THYE, F. W. See Jenny, B. F., 379.
TIDEMANN, L. J. See Schingoethe, D. J., 1304.
Tissue and plasma free amino acid concentrations in rats fed tryptophan-imbalanced diets with or without niacin, 1584.
α-Tocopherol, dietary, and oxidized menhaden oil and ethoxyquin interactions in channel catfish (*Ictalurus punctatus*), 1416.
—; relative potency of several forms of in the chick liver storage bioassay, 79.
TONTISIRIN, K., V. R. YOUNG, W. M. RAND AND N. S. SCRIMSHAW. Plasma threonine response curve and threonine requirements of young men and elderly women, 495.
TOVERUD, S. U. See Ramp, W. K., 803.
Toxicities, relative, of selenite and selenate in drinking water of rats, 306.
Toxicity of dietary methyl mercury and mercuric chloride in the rat; effect of selenite on, 638.
Trace elements; life-term effects of nickel in rats: survival, tumors, tissue levels and interactions with, 239.
— metals; interactions in rat tissues: cadmium and nickel with zinc, chromium, copper and manganese, 167.
Triglyceride metabolism in pyridoxine-deficient rats, 91.
—secretion rates: use of Triton WR 1339 in the rhesus monkey, 223.
Triton WR 1339; effects on plasma lipids in rhesus monkey, 223.
TROTT, D. R. See Young, J. W., 1049.
Trout; effect of dietary biotin and lipid on growth, stamina, lipid metabolism and biotin-containing enzymes, 315.
—, rainbow, fingerlings; effect of vitamin A and methionine on growth and amino acid composition of body protein in, 865.
TRYFIATES, G. P. See Puskar, T., 1407.
Tryptophan; enzymatic conversion of to kynurenine by rat liver, 227.
— -imbalanced diets with or without niacin; plasma and tissue free amino acid concentrations in rats fed, 1584.
— and methionine metabolism of adult females as affected by vitamin B-6 deficiency, 1348.
—; nitrogen retention of adult human subjects fed varying quantities of, 1121.
TSAI, A. C., D. R. ROMSOS AND G. A. LEVEILLE. Significance of dietary carnitine for growth and carnitine turnover in rats, 782.
TUMBLESON, M. E. See Badger, T. M., 1329, 1339.
TURNER, L. G. W. See Gubler, C. J., 1690.
TURPIN, K. K. See Gubler, C. J., 1690.
TYGSTRUP, N. See Keiding, S., 294.
Tyrosine aminotransferase, induction of, and depression of protein synthesis in rat liver by a tryptophan-free mixture of amino acids, 1149.
— aminotransferase levels and organ weights in the rat during adaptation to periodic fasting, 1356.
— transaminase activity; induction of by hydrocortisone in vitamin B-6-deficient rats, 1407.

U

UCKERT, J. R. See Schingoethe, D. J., 1304.
Urea cycle enzymes and citrulline levels in uremic rats, 678.
— excretion in the pig as an indication of protein quality and amino acid requirement, 542.
Urolithiasis in rats; development and reversibility by mineral mixtures, 599.

V

VAN BEEK, L., V. J. FERON AND A. P. DE GROOT. Nutritional effects of alkali-treated soyprotein in rats, 1630.
VAN CAMPEN, D., AND W. A. HOUSE. Effect of a low protein diet on retention of an oral dose of ^{65}Zn and on tissue concentrations of zinc, iron, and copper in rats, 84.
———. See Gipp, W. F., 532.
VAN MARTHENS, E. See Zamenhof, S., 1002.
VAVICH, M. G. See Peng, Y., 1008.

VERNEY, E., AND H. SIDRANSKY. Alterations in cardiac protein metabolism in rats force-fed a threonine-devoid diet, 463.
———. See Sidransky, H., 726.
VIJAYAKUMAR, S. T., AND P. A. KURUP. Hypervitaminosis D and glycosaminoglycan metabolism in rats fed normal and high fat cholesterol diets, 423.
VISEK, W. J. See Gipp, W. F., 532.
———. See Milner, J. A., 1681.
Vitamin A deficiency and the glycoproteins of rat corneal epithelium, 710.
— deficiency and reproduction in rhesus monkeys, 1513.
— deficiency, synchronous, rapid; induction of in rats, 1140.
— and glucosaminoglycan metabolism in rats, 871.
— intoxication; effect on intracranial pressure and brain water in rats, 478.
—; liver storage of by rats fed carrots in various forms, 1115.
— and lysosomal stability in rat liver, 1466.
— and methionine; effect on growth and amino acid composition of body protein in rainbow trout fingerlings, 865.
—; the "partial" function of α-retinol, 1662.
Vitamin B-6 deficiency; tryptophan and methionine metabolism of adult females as affected by, 1348.
— -deficient rats; induction of tyrosine transaminase activity by hydrocortisone in, 1407.
— -repleted dams; behavior and brain components of male rat progeny from, 810.
— requirement and glutamate decarboxylase activities; relationship between in brains of male rats, 1657.
—; triglyceride metabolism in pyridoxine-deficient rats, 91.
Vitamin B-12 derivatives; effect on embryonic development and growth in the chick, 28.
— requirement of the chick; effect of feeding carbohydrate-free diets on, 394.
Vitamin D excess and glycosaminoglycan metabolism in rats fed normal and high cholesterol diets, 423.
—, metabolites of; role in phosphate transport in rat intestine, 1056.
—, a new bioassay for: duodenal calcium binding protein, 1202.
Vitamin E; activity of γ-tocopherol in the rat, chick and hamster, 850.
— -deficient rabbit; protein synthesis in the skeletal muscle of, 521.
—; effect of on δ-aminolevulinic acid dehydratase activity in weanling rabbits with chronic plumbism, 1637.
— and PUFA, dietary; effect on peroxidative hemolysis and erythrocyte fatty acids in the rabbit, 192.
—; relative potency of several forms of α-tocopherols in the chick liver storage bioassay, 79.
— and selenium; dietary requirements for as measured at the cellular level in the chick, 1292.
— and selenium function in the chick; antioxidant effects on, 1297.
Vitamin K deficiency and epoxidation of vitamin K in the rat; influence of sex hormones on, 660.
VOHRA, P. See Kadirvel, R., 1127.
VON DER DECKEN, A. See Omstedt, P. T., 1061.
VU, M.-L. See Goswami, T., 1257.
———. See Srivastava, U., 512.

W

WAGNER, C. See Howard, L., 1024.
WAKELING, A. E. See Milner, J. A., 1681.
WALKER, P. R. See Yager, J. D., Jr., 273.
WALSER, M. See Chow, K.-W., 1208.
WANG, M. See Chan, W., 678.
WAPNIR, R. A., AND F. LIFSHITZ. Absorption of amino acids in malnourished rats, 843.
WARKANY, J. See O'Toole, B. A., 1513.
WASSERMAN, R. H. See Bar, A., 1202.
WATSON, J. J. See Mack, D. O., 12.
WEINLAND, B. T. See Menge, H., 1554.
WELCH, R. M., W. A. HOUSE AND W. H. ALLAWAY. Availability of zinc from pea seeds to rats, 733.
WELLS, W. W. See Schroeder, H. R., 943.
WESER, E. See Young, E. A., 994.
Wheat gluten; repression of rat liver HMP shunt dehydrogenases by, 957.
WHITAKER, J. R. See Fossum, K., 930.
WHITTLE, B., AND J. T. SMITH. Effect of dietary sulfur on taurine excretion by the rat, 666.
WIATROWSKI, E. See Osis, D., 1313.
WILLIAMS, H. H. Leonard Amby Maynard—a biographical sketch, 1.
WILLIAMS, W. F. See Bull, L. S., 968.
WILLINGHAM, A. K. See Matschiner, J. T., 660.
WILSON, H. R. See Roland, D. A., Sr., 1079.
WILSON, J. G. See O'Toole, B. A., 1513.
WOLF, G. See Kim, Y.-C. L., 710.
———. See Sneider, W. D., 1662.
Woolley, Dilworth Wayne; biography of, 507.

Y

YAGER, J. D., JR., M. J. LICHTENSTEIN, R. J. BONNEY, H. A. HOPKINS, P. R. WALKER, C. G. DORN AND V. R. POTTER. Effects of various feeding and exercise regimens on rat growth and survival, 273.
YAMADA, E. See Nakagawa, I., 1576.
Yeast, high lysine baker's; production and nutrition evaluation of, 884.
YOSHIDA, A. See Aoyama, Y., 741.
YOUNG, E. A., AND E. WESER. Nutritional adaptation after small bowel resection in rats, 994.
YOUNG, F. Serum lipids of young Show Racer and White Carneau pigeons fed a semipurified diet with or without cholesterol, 719.
YOUNG, J. W., D. R. TROTT, P. J. BERGER, S. P. SCHMIDT AND J. A. SMITH. Gluconeogenesis in ruminants: glucose kinetic parameters in calves under standardized conditions, 1049.
YOUNG, V. R. See Tontisirin, K., 495.
YOUNOSZAI, M. K., AND A. LYNCH. In vivo intestinal absorption of hexose in growth-retarded suckling rat pups, 671.
YURA, K. See Kiriyama, S., 69.

Z

ZAMENHOF, S., S. M. HALL, L. GRAUEL, E. VAN MARTHENS AND M. J. DONAHUE. Deprivation of amino acids and prenatal brain development in rats, 1002.

ZIEVE, L. See Derr, R. F., 65.
ZILVERSMIT, D. B. See Balmer, J., 1319.
ZIMMERLI, A. See Pothoven, M. A., 430.
Zinc availability in leavened and unleavened wholemeal wheaten breads, 976.
— availability to rats from pea seeds, 733.
— and copper nutriture interrelationships in the rat, 1458.
— deficiency during lactation; effect on postnatal growth and development of rats, 828.
— deficiency; effect of from day 18 of gestation and/or during lactation on the development of some rat brain enzymes, 1525.
— -deficient rat; altered preference for sodium chloride, anorexia, and changes in plasma and urinary zinc in, 1108.
—; effect on lipid peroxidation and metal content in some rat tissues, 434.
— excretion, endogenous, in the bovine; role of pancreas in, 1279.
—, iron and copper concentrations in rat tissues; effect of a low protein diet on retention of ^{65}Zn and on, 84.
— requirements of man: a conspectus of research on, 345.
ZUKOSKI, C. See Chvapil, M., 434.